JOURNAL
OF THE
WASHINGTON ACADEMY OF SCIENCES

VOLUME 34 DECEMBER 15, 1944 No. 12

ETHNOLOGY.—*The Delaware Indians as women.*[1] C. A. WESLAGER, Archaeological Society of Delaware. (Communicated by WILLIAM N. FENTON.)

Among the strange concepts in the social symbolism of the American Indian tribes of the East was the treatment accorded a vanquished enemy group by the victors. We have heard much repeated, analyzed, and even contradicted accounts in a century and a half of historical literature concerning the relationship between the Five Nations Iroquois and the Delaware Nation, culminating in the degradation of the latter. The Five Nations relegated the Delaware to a position of "women" by applying the symbolic attributes of the female to them as a nation of women, devoid of political or military power. This subjugation and lowering of status of the enemy were linked with sexual connotations, real and symbolical, which are fraught with mystery and which placed the Delaware tribe in a subservient social position. As women they could not go to war or negotiate peace treaties. In fact, their entire political organization by this act of humiliation was deprived of masculine prerogatives. They were compelled to accept the chiefs of the Iroquois Confederacy, the League of Five Nations, as their spokesmen, agents and overlords in the political family of nations.

Loskiel, the Moravian historian, was among the first contemporary observers to call attention in print to the Delaware in their status as women. The story related to him either directly by Delaware informants, or more probably to him through his fellow missionary Heckewelder, was that in the distant past the Five Nations met with the Delaware and convinced them that it was senseless for the Indians to war against each other as they had been doing. The Five Nations proposed, therefore, that the Delaware tribe accept an honorable, noncombatant position as peacemakers. In such a role they would not engage in combat and consequently as a neutral party could negotiate peace between warring tribes. The right was one that belonged to the "tribal matrons" as the position accorded women was regarded in their social policies, who could with impunity propose cessation of hostilities to their men fighters. Such subterfuge would permit their warriors to "save face," since it would not be necessary for either of them to sue for peace. Yet both would be spared further bloodshed. The Delaware, so their story went, accepted this respected position as matrons. During a ceremony that marked the occasion, the Iroquois, according to the Delaware version, are supposed to have said: "We dress you in a woman's long habit reaching down to your feet and adorn you with earrings," meaning that they should not take up arms again. "We hang a calabash filled with oil and medicine on your arms," meaning that they should use the oil to clean the ears of those who could not distinguish good from evil, and also use the medicine to heal those walking in evil. "We deliver unto your hands a plant of Indian corn and a hoe," meaning that they should thereafter be as women.[2]

Later the Delaware claimed that they had been duped, their independence forfeited, their autonomy humiliated. After accepting the pact in good faith, they said that they found they had sacrificed their individual rights and the Five Nations were exploiting them and that they were helpless

[1] Received October 4, 1944.

[2] G. H. LOSKIEL, *History of the mission of the United Brethren*, etc.: 126. London, 1794.

to retaliate, having obligated themselves by their sacred word of honor which could not be broken.

The Five Nations told an entirely different story. They averred that the Delaware version was a complete fabrication to win sympathy. They maintained they had conquered the Delaware fairly in open battle and as a penalty had reduced them to the disgraceful position of women. Thus the impartial observer has found himself faced with two opposing views and is at a loss to settle on the correct one. Zeisberger[3] presents the two sides to the controversy as does Heckewelder,[4] although the latter's conclusions are that the Delaware story was the authentic one. He deduced from information given him that the Dutch had instigated the scheme to weaken the Delaware.

Morgan claims that it is true that the Five Nations defeated the Delaware and that the latter acknowledged their dependence by sending tributary wampum but were not then reduced to womanhood. However, Morgan says that while the Delaware were under the protection of the Five Nations they made inroads upon a western nation also under Five Nations dominance. To punish the Delaware for their unauthorized conduct a deputation of Iroquois chiefs went among them and degraded them from the rank of a tributary nation to that of women. Morgan unfortunately does not give us the source of his information. He makes an obvious error by stating that the Delaware "never emancipated themselves after this act of denationalization," as we shall shortly see.[5]

Brinton devotes a chapter to the Delaware as women but touches only superficially upon the historical events from 1754 to 1758, when the relationship between the Delaware tribe and Five Nations reached its climax and when the details of the feminization stand out in clearer perspective. Brinton says that the feminizing occurred around 1725 and that the Five Nations made the Delaware as women in consequence of their refusal to join in an attack on the English settlements. This explanation is based entirely on an interpretation given him by Shawnee informants but is not tenable, for the Five Nations were long known to be pro-English.[6]

The writer has had the good fortune to uncover hitherto unrecognized sources in the Provincial Records of Pennsylvania regarding the Delaware as women. The references at hand do not entirely explain but they add measurably to our understanding of this little known and much debated diplomatic contention.

Early in colonial history, the Five Nations (later known as the Six Nations) assumed a position of dominance over the Indians living in the Delaware and Susquehanna River Valleys.[7] After defeating the Susquehannock Indians, they seized control of the Susquehanna Valley and appointed their agent Shikellamy to supervise the affairs of the Susquehannock as well as the Shawnee, Conoy, Nanticoke, and others who had lately settled in the region by their invitation.[8]

As a result of white intrigue in land sales and the pressure exerted by the Five Nations, the Delaware Indians, who had formerly occupied eastern Pennsylvania, New Jersey, and the northern parts of Delaware as a solid nation, began to experience political disintegration. By 1712 some remained in New Jersey; a larger body of

[3] *David Zeisberger's History of the Northern American Indians*, ed. by A. M. Hulbert and W. N. Schwarze. Ohio State University, 1910.

[4] JOHN HECKEWELDER, *History, manners and customs of the Indian Nations*. Historical Society of Pennsylvania, Philadelphia, 1876.

[5] LEWIS H. MORGAN, *League of the . . . Iroquois:* 328–329. New York, 1922.

[6] D. G. BRINTON, *The Lenape and their legends*. Philadelphia, 1885.

[7] For a summation of the Iroquois and their historical position, see WILLIAM N. FENTON, *Problems arising from the historic northeastern position of the Iroquois*, Smithsonian Misc. Coll. 100: 159–251. May 1940.

[8] The present author discusses the subjection of the Nanticoke in *The Nanticoke Indians in early Pennsylvania history*, Pennsylvania Mag. Hist. and Biogr., Oct. 1943: 345–355. Additional data are presented in an essay, *The Nanticoke Indians, their emperors and estates*, to be published soon by the Historical Society of Delaware.

For a discussion of the absorption into the League of these subjected tribes see FRANK G. SPECK, *The Nanticoke and Conoy Indians*. Historical Society of Delaware, 1927.

Munsee affiliation was settled at the forks of the Delaware near present Easton; some were living on the Schuylkill River; and a few families remained on the upper Brandywine. Others had moved west and were living on the Susquehanna, and some had even straggled farther west to establish themselves in the Allegheny Valley at Kittanning.

In May, 1712, Sassoonan, also called Allumapees, and Skalitchy, chiefs of the Unami Delawares, met with the Pennsylvania governor and acquainted him that "many years ago being made tributary to the Mingoes or 5 Nations and being now about to visit them," they deemed it proper to show the governor the tribute they were carrying to their overlords. It consisted of 32 belts of wampum. The chiefs also exhibited a pipe with a stone head, which had been given them by the Five Nations who, they frankly admitted, "had subdued them and obliged them to be their tributaries."[9]

This is an important reference because it is the earliest admission appearing in the public documents, by the Delaware themselves, that they had actually been subdued by the Iroquois. Two years later Sassoonan said in another conference that the "Five Nations had often told them that they were as Women only and desired them to plant corn and mind their own private business for that they [the Five Nations] would take care of what related to war and peace."[10]

By 1742 the Delaware Indians remaining at the forks of the Delaware near Easton demanded that the English make restitution for the lands which they had confiscated, especially in the fraudulent "walking purchase" of 1737. The English produced deeds to prove that they had paid for the lands. The controversy reached its climax at a meeting held on July 12, 1742, with the Pennsylvania authorities. Also present were Canassatego and Shikellamy representing the Five Nations; Sassoonan representing the Unami Delawares then living at Shamokin; and Nutimus and other chiefs representing the Delaware Munsi living at the forks whose lands were the point at issue.

At this meeting Canassatego made a speech, now famous in Indian history. He upbraided these Delaware chiefs unmercifully for questioning the words of "their fathers," the English, and then he said:

"But how came you to sell land at all? We conquered you, we made Women of you, you know you are Women, and can no more sell land than women. . . . We therefore assign you to two places to go, either to Wyomon or Shamokin. You may go to either of these Places, and then we shall have you more under our Eye and shall see how you behave."[11]

He forthwith seized the Delaware speaker by the hair and forced him out of the council room. Canassatego, as we have reason to believe, may have conspired with the English to rid the land of the Delaware, but the fact remains that his accusation of the Iroquois having made the Delaware as women *through conquest* stood without refutation.

Two bands of Delaware, humbly yet reluctantly, settled at the two assigned villages under the vigilant eye of Shikellamy, the Five Nation agent. In a short time, some of them moved farther west to join the growing bands of the Allegheny under the leadership of the two brothers, Chief Beaver and Chief Shingas.[12] Sassoonan remained on the Susquehanna River with

[9] *Minutes of the Provincial Council* **2**: 546. This set of records on which most of this essay is based will be referred to hereafter as "Minutes." It was issued in 16 volumes, under the full title, *Minutes of the Provincial Council of Pennsylvania*, published by the State. Volumes 1, 2, and 3 were printed by Jo. Severns & Co., Philadelphia, 1852. Volumes 4 to 16, inclusive, were printed by Theo. Fenn & Co., Harrisburg, 1851–1852.

[10] Minutes **3**: 334. Sassoonan is believed by some historians to be a son of the famous Tamanend.

[11] Minutes **4**: 578. As we know today, Wyomon, or Wyoming, was on the north branch of the Susquehanna River near present Wilkes Barre, Pa. Shamokin was near the present site of Sunbury, Pa.

[12] C. HALE SIPE, *Indian wars of Pennsylvania:* 276, Harrisburg, 1929, points out that they were brothers. Beaver's son Peter later became a renegade leader of some of the Delaware; see Minutes **7**: 381. Shingas and Beaver are believed to have been nephews of Sassoonan, and thus descendants of the great chief Tamanend. Like Tamanend, they were members of the Turkey Clan.

others of his tribe until the time of his death about 1748.[13] For a time following his death, the Delaware were without a national leader. Finally, from the village Wyoming, a new figure arose to lead them, a chief who was to become one of the greatest Delaware sachems of all time—Tedyuskung, or as he was called in English, Honest John.[14] In 1755 he was acknowledged by the Five Nations as the Delaware "king."[15]

With the changes in Indian political life, there were also transitions taking place among the whites which must be given due attention for a full understanding of Indian relations. By 1754 the situation in colonial affairs was as follows:

The French and English had crossed paths in the New World and were about to declare war on each other. The Five Nations allied themselves with the English, promising the assistance of the tribes then under their domination, including Delaware, Nanticoke, Conoy, Shawnee, Twightwee, and Susquehannock (called Conestoga). The French, in turn, were doing their utmost to incite the Indians to arise and join them in an attack on the English. The French were especially determined to gain control of the Ohio Valley and its tributaries, and sent their emissaries to contact the Delaware and Shawnee living there and solicit their aid. They threatened the Indians with extinction if they did not join them in warring against the English. Out of this crisis, well recorded by colonial scribes, we can see the Delaware breaking their feminine shackles. In 1754 one of the Delaware bands sensing they were in jeopardy sent the following message to the Five Nations; the italics are mine:

"Uncles the United Nations. We expect to be killed by the French your fathers; we desire, therefore, *that you will take off our petticoat that we may fight for ourselves*, our Wives and Children; in the condition We are in you know we can do nothing."[16] Their "condition" as women meant that they were unable to protect themselves.

The Delaware chief Beaver also addressed himself to the Five Nations as follows; the italics are mine:

"Uncles: *I still remember the time when you first conquered us and made Women of us* and told Us you took Us under your Protection and that we must not meddle with Wars but stay in the House and mind Council affairs. We have hitherto followed your directions and lived very easy under your Protection, and no high Wind did blow to make us uneasy, but now things seem to take another turn and a high wind is raising. We desire you, therefore, Uncles, to have your eyes open and watchful over us, your Cousins, as you have always been heretofore."[17]

Tedyuskung, speaking at a council meeting with the English in 1755, voiced a hope that the Delawares would eventually be emancipated from womanhood when he said:

"Tho our Uncles have made Women of Us, yet in time to come We may have children, who when born, may look up and see the Sun and Sky clear and the Roof open between Us and You; and we will advise them to take and always continue to hold fast by the middle of that Chain as their ancestors have done before them."[18]

After Braddock's defeat by the French and Indians, there was terrible bloodshed on the Pennsylvania frontier. The Delaware, still angered at the confiscation of their lands by the English and goaded on by the French, joined the Shawnee and deserted the English interests. They allied with the French, detached themselves from their dependence on the Five Nations, and went on the warpath. They burned many

[13] Minutes 5: 222 state that the Delawares in 1748 were looking for a proper person to succeed "Olomipas, the King of the Delawares lately deceased." In Vol. 7, p. 726, it is brought out that he was of the Unami, the "sub-tribe" who claimed hereditary chieftainship over the other Delawares, according to Brinton, *op. cit.*

[14] Sipe, *op. cit.*, p. 262, says that Tedyuskung was the son of John Harris and was born in Trenton, circa 1705. This is corroborated in Minutes 7: 359, where it is stated that he had moved from New Jersey to Wyoming. Also in Vol. 7, p. 220, it is noted that Tedyuskung had three sons, Amos, Kesmitas, and John Jacob. Later we see that a chief named Captain Bull was termed a son of Tedyuskung. Heckewelder, *op. cit.*, p. 302, says that Tedyuskung joined the Indian Christian congregation in 1749 and was baptized and given the name Gideon.

[15] Minutes 7: 199.

[16] Minutes 6: 36.

[17] Minutes 6: 155.

[18] Minutes 6: 363.

homes, scalped settlers, and took scores of women and children prisoners. They revealed themselves as ruthless warriors and not the peaceful women they were reputed to be.

The Five Nations sent an ultimatum to the Delaware to cease hostilities against the English with whom the Five Nations were then more closely allied than ever before. The Delaware refused flatly and replied as follows to the message from their overlords; the italics are mine:

"We are men and are determined not to be ruled any longer by you as Women; And we are determined to cut off all the English except those that may make their escape from us in Ships. So say no more to us on that Head, *lest we cut off your Private Parts and make Women of you as you have done of us.*"[19]

The English, with the endorsement of the Five Nations, subsequently declared war on the Delaware, offering bounties for their scalps. Here followed a period of conflict that does not now concern us.

By 1756, however, the Delaware repented having attacked the English, and Tedyuskung opened negotiations with the English for a permanent peace and a satisfactory settlement of the land disputes. The Five Nations then aware that the Delaware were no longer willing to remain in the inferior position of women felt it expedient to allow them more latitude. Tedyuskung appeared before the Pennsylvania Council in July of 1756 and exhibited a wampum belt. "This belt," he said, "denotes that the Six Nations by their chiefs have lately renewed their covenant chains with us; formerly we were Accounted Women, and employed only in Women's business, but now they have made men of us and as such we now come to this Treaty having the authority as a Man to make peace."[20]

Tedyuskung exaggerated when he claimed that the Iroquois had made them completely men, for it was a masculinity with the specific reservation that the Delaware refrain from making war. In fact, the wampum belt sent to Tedyuskung by the Iroquois, which he exhibited, had been accompanied by the following significant message:

"Cousins, the Delaware Indians: You will remember that you are our women; our forefathers made you so, and put a petticoat on you and charged you to be true to us and lie with no other man. But of late you have Suffered the string that tied your petticoat to be cut loose by the French and you lay with them and so became a common bawd, in which you did very wrong and deserve Chastisement, but notwithstanding this, we will still Esteem you, and as you have thrown off the Cover of your modesty and become Stark naked which is a shame for a woman, we now give you a little Prick and put it into your Private Parts, and so let it grow there till you shall be a compleat man. We advise you to act as a woman yet, But be first instructed by us, and do as we bid you and you will become a noted man."[21] Thus did the Five Nations express themselves as willing to have the Delaware eventually rate full manhood provided they followed their bidding. They were reluctant to relinquish a control they had exercised over the vanquished tribe for many years, but they realized they were now dealing with warriors who might suddenly turn against them as they did against the English.

The Pennsylvania governor, desirous of verifying Tedyuskung's standing, sent an Iroquois messenger named New Castle to confer with the Five Nation chiefs to appraise the status of the Delaware. New Castle conferred with several sachems, including Canyase, a Mohawk chief and one of the principal counselors of the League. Canyase admitted having had a long discourse with Tedyuskung, at which time he reminded him that the Delaware were women, and in attacking the English had behaved in a manner not becoming to their condition. "But," Canyase had said to Tedyuskung, "since you have been so foolish as to obey that voice, a Stranger's voice and cut off your Pettycoats and taken the Tomahawk and now appear in the Character of a Man. I join and help to cut off your Pettycoats, and so far make a Man of you, but I do not put the Tomahawk in

[19] Minutes 7: 522.
[20] Minutes 7: 213.
[21] Minutes 7: 218.

your hand. I know what is for your good and therefore I will not allow you to carry a Tomahawk."[22]

Having had his figurative skirts removed, Tedyuskung's position was strengthened, and he embarked on a program to consolidate the Indians. Within a short time he claimed to be not only the "king" of the Delaware but a "spokesman" empowered by ten nations, namely, "the Lenopi, Wenami, Munsey, Mahickon, Tiawaco or Nanticokes, Senecas, Onandogas, Cayugas, Oneidas and Mohawks."[23] Furthermore, his position was strengthened when he was appointed by the English as one of their Indian agents, and in his dealings he was assisted by Charles Thompson, a Philadelphia Quaker and a champion of Indian rights, who served as the chief's secretary in some of the conferences with the whites.[24]

At a council meeting with the Pennsylvania authorities held at Easton, Tedyuskung announced that he was now a man. He said (the italics are mine):

"Now you may remember I was stiled by my uncles the Six Nations a Woman in former years and had no hatchet in my hand, but a pestle or Hominy pounder. But now, Brethren, *here are some of my Uncles, who are present to witness the truth of this;* as I had no Tomahawk and my Uncles were always stiled Men and had Tomahawks in their Hands, they gave me a Tomahawk. And as my Uncles have given me a Tomahawk and appointed and authorized me to make peace with a Tomahawk in my Hand, I take that Tomahawk and turn the edge of it against your enemies, the French.[25]

Thus, by diplomatic negotiation, Tedyuskung placed the Five Nations in the position of being forced to recognize the Delaware as men. If they refused to give them the tomahawk and prohibited them from fighting, it would displease the English and make it appear that the Five Nations were unwilling to support the English cause with all their resources.

Those of his "uncles" whom Tedyuskung offered in witness to the statement that he was now a man were not members of the Great Council but young Iroquois braves who had no authority to speak for their elders, although the English seemingly were not fully aware of this.

At a subsequent conference in 1758, a delegation of *bona fide* Five Nations chiefs, angered at Tedyuskung's self-imposed authority, demanded to know who gave him the authority he claimed. For a moment, his fate hung in the balance, and the fate of the Delaware as a whole, but having won the confidence of the English and of his own people, he managed to retain his position of importance. He was also shrewd enough when confronted by his Iroquois critics to answer that while he was a chief of the Delaware he was only a humble messenger of his "Uncles and Superiors."[26] Nevertheless, he had effectively severed the bonds of womanhood, even though the Delaware continued to rely on the Five Nations for advice and to respect their wishes. The Five Nations, in turn, no longer commanded the Delaware, but on one occasion "asked" as their indulgent uncles that they return the English captives they had taken during the earlier frontier incidents.[27]

It is also significant that the Delaware's emancipation from the Five Nations was known and accepted by other tribes, as evidenced in a note sent to Tedyuskung in

[22] Minutes 7: 297. New Castle's Indian name was Cashiowayah. He succeeded Scarroyady who succeeded Shikellamy as the Iroquois agent over the tributary tribes.

[23] Minutes 7: 665. Tedyuskung's genius is evidenced in the adroit way he renewed friendship with the English after the frontier massacres, and at the same time outsmarted the Five Nations. That he exercised authority he did not rightfully possess must now be admitted, although it was then not known to the English. In 1758 he said that eight more nations had joined the ten he already represented, namely, "Ottawas, Twightwees, Chippewas, Toawaws, Caughnawagos, Mahoowa, Pietoatomaws, and Nalashawwna." See Minutes 8: 33.

[24] Minutes 7: 664. Tedyuskung was probably the first Indian chief to appear at a meeting with his own secretary to make a written record of the transaction. The whites usually were the only party of the contract who had a written record, and this obviously placed them in an advantageous position, because the Indians were forced to trust to memory. See also CHARLES THOMPSON, *An inquiry into the causes of the alienation of the Delaware and Shawnee Indians.* Philadelphia, 1867.

[25] Minutes 7: 710.

[26] Minutes 8: 191–192.

[27] Minutes 8: 194.

1758 by the Cherokee in which this excerpt appears. "*Formerly*, you used to Wear a petticoat and did not go to war, etc."[28] Nevertheless, the reader must not gather the impression that all of the Delaware were immediately relieved of the pressure from the Five Nations. The tribe at that time was widely scattered, and some of the outlying Munsee bands continued to be dominated by the Seneca. In May, 1758, a Seneca chief reported in a conference with the whites that the "Munseys are Women and can not hold treaties for themselves."[29] The Munsee, as we know today, were affiliates of the Unami, or Delaware proper, but like the Mahican were a separate political entity.

Tedyuskung's decease, a sudden and irreparable loss to the Delaware, was a tragic one. On April 16, 1763, he was burned to death in a fire which razed his cabin at Wyoming. It is said that the old chief was in a drunken stupor and that the Five Nations started the fire with the deliberate purpose of killing him.[30]

During the Revolution the Five Nations continued in their alliance with the English, whereas most of the Delaware went over to the American cause. In 1775, at a meeting in Pittsburgh, the Seneca made a final effort to win the Delawares over to their side, and reminded them that they had once been women. The Seneca had apparently never reconciled themselves to the fact that the Delaware had regained their manhood, nor publicly admitted it. The Delaware chief, Captain White Eyes (Koquethagechton of the Turtle Clan) replied as follows to the insinuation:

"You say that you had conquered me, that you had cut off my legs—had put a petticoat on me, giving me a hoe and corn pounder in my hands saying: 'Now woman! Your business henceforward shall be to plant and hoe corn and pound the same for bread for us men and warriors.' Look at my legs! If as you say, you had cut them off, they have grown again to their proper size!—the petticoat I have thrown away, and have put on my proper dress; the corn hoe and pounder I have exhanged for these firearms and I declare that I am a man."[31]

In 1779 the Delaware under the leadership of Captain White Eyes joined Colonel Daniel Brodhead in an expedition against the Seneca. Thus they showed their contempt even more eloquently than in words. After White Eyes' death, some of the Delaware were persuaded by Captain Pipe, another Delaware chief, to go over to the British side, and once more they were allied with their former Iroquois overlords. In the upheaval in the Indians' social and political organizations during the Revolution, it is exceedingly difficult to find either continuity or consistency in their behavior.

In 1794, shortly before the treaty of Greenville, the Five Nations delegates came forward to declare officially that the Lenape (Delaware) were no longer women but men, and the famous chief Joseph Brant formally placed in their hands the war club.[32]

CONCLUSIONS

Without presuming to add finality to the question of the Delaware as women, we can draw from our data, which contain specific admissions by Delaware speakers of their defeat, that the Five Nations feminized the Delaware prior to 1712 through conquest. Between then and 1756, the Five Nations treated the Delaware contemptuously, prohibiting them from going to war or making treaties. Following Braddock's defeat the Delaware went on the warpath against the English, refusing to accede to the demands of the Five Nations that they lay down their arms. Under the leadership of Tedyuskung, the Delaware by 1756 declared that they were not women and forced the Five Nations to accept them on new and more liberal terms. However, the Five Nations did not then grant them complete manhood and withheld granting them permission to go to war.

[28] Minutes **8**: 136.
[29] Minutes **8**: 158.
[30] GEO. P. DONEHOO, *in* Hodge, F. W. (Ed.) *Handbook of American Indians*, Bur. Amer. Ethnol., Bull. 30, **2**: 714–717. 1910.
[31] JOHN HECKEWELDER, *Narrative of the mission of the United Brethren among the Delaware and Mohegan Indians:* 140–141. Philadelphia, 1820.
[32] HECKEWELDER, *op. cit.*: 70; SCHWEINITZ, *Life of David Zeisberger:* 430, 641.

During the Revolution, the Delaware denied they were in any way under Five Nations' domination and joined the colonists in fighting the English and their Five Nation allies. Finally, as an anticlimactic gesture, at the close of the Revolution, the Iroquois conceded that the Delaware were no longer women but men.

In the sexual symbolism of the feminizing, we recognize unfathomed depths in native philosophy. Whether the figurative deprivation of the Delaware of their male accoutrements, both physiological and cultural, had its origin in literal practices remains unknown. Brinton claims, quoting Hammond, that young men of some of the western tribes were deprived of their virility, clothed like women, and assigned to women's work.[33] The institution of the berdache or transvestite was widespread among American tribes, which attests to its antiquity, and it is well known from the Plains. However, the feminizing of the Delaware, which follows similar lines of thought, is the outstanding recorded instance of its kind in the East. It is probably the only time that the rite was so institutionalized as to affect the status of an entire tribal group.

[33] Brinton, *op. cit.*: 110.

PALEONTOLOGY.—Thyridocrinus, *a new inadunate crinoid genus from the Silurian.*[1] EDWIN KIRK, U. S. Geological Survey.

In 1908, Slocum described a crinoid from the Niagaran of Illinois as *Achradocrinus patulus*. This is the first recorded occurrence of a crinoid referable to the family Gasterocomidae in the Silurian. In 1926, Springer described a crinoid from the Middle Silurian of Tennessee, which he placed with doubt in the genus *Lecythiocrinus*. He specifically states that the form could not be referred to the Gasterocomidae. In the present paper both of these species are included in a new genus *Thyridocrinus*, which is placed in the Gasterocomidae.

Thyridocrinus, n. gen.

Genotype.—Lecythiocrinus? problematicus Springer.

Only the theca is known, but this is in an excellent state of preservation. Both species referred to the genus are small.

Dorsal cup. Low, broadly turbinate, composed of very heavy plates.

IBB. Three elements. The unfused *IB* is right-posterior in position.

BB. Small, except the posterior, which is considerably larger than the others in the type species. In the type species the distal face of *post B* forms the lower margin of the exposed lateral opening. In *T. patulus* a plate is interposed between *post B* and the opening.

RR. Large, with very large articulating faces. The arms must have been very heavy and directed nearly horizontally outward, closely simulating *Arachnocrinus*. The articulating face is pierced by a submedian axial canal. The distal portions of the radials form a broad shelf, leaving a relatively small area to be covered by the tegminal plates. The two posterior radials meet above the lateral opening.

Post IR. As noted above, in the type species the lateral opening is bounded below by the *post B*. In *T. patulus* a plate rests on the truncated distal face of *post B*, and this in turn forms the lower margin of the lateral opening. The significance of this plate and the nature of the lateral opening will be discussed later.

Tegmen. The greater part of the tegmen consists of a somewhat elevated rosette of irregularly disposed plates. At a lower level, between the rosette and the inner margins of the radials, are small groups of tegminal plates lying in the interambulacral areas. Each interambulacral area has from one to three of these plates. The rosette consists in the main of five orals. The posterior oral is large and is probably a madreporite, although pores cannot be made out with certainty. Radiating from the periphery of the rosette and covering the ventral groove of each radial is a double row of covering plates

[1] Published by permission of the Director, U. S. Geological Survey. Received August 30, 1944.

having a biserial arrangement. These doubtless extended outward, covering the ventral groove of the arm.

Column. Lumen circular, as judged by the perforation of the *IBB*.

Geological range.—*Thyridocrinus* is known at present only in the Middle Silurian of Illinois and Indiana.

Species referred to the genus.—

Thyridocrinus problematicus (Springer), n. comb.

(*?*) *Lecythiocrinus problematicus* Springer, 1926, p. 133, pl. 31, figs. 11, 11a, 11b: "Laurel limestone, Niagara, St. Paul, Indiana."

As photographed and described by Springer the type specimen of *T. problematicus* had the infrabasals intact. When first seen by me the specimen was mounted, base down, on a bit of plasticine affixed to a strip of light cardboard. Upon detaching the specimen it was found that the *IBB* were missing. The contact faces of the surrounding basals are perfectly clear and show that the arrangement of the *IBB* was that described and figured by Springer. The one missing structure is the lumen.

Thyridocrinus patulus (Slocum), n. comb.

Achradocrinus patulus Slocum, 1908, p. 288, pl. 85, figs. 1–4: "Clay pockets of the Niagara limestone at Romeo [Illinois]."

Elsewhere, pages 273–275, Slocum explains that these silicified fossils found at Romeo came from postglacial clays filling erosion channels in the Niagaran dolomite. The original source of the crinoid and associated fossils was a limestone near Lemont, Ill., some 5 miles distant. This limestone in place yielded a fauna that Slocum considered very much like that of the Silurian at St. Paul, Ind. (Laurel limestone).

Slocum's reference of his species to *Achradocrinus* is quite understandable but can not be maintained. Shultze's figures of *Achradocrinus ventrorsus* (1866, pl. 12, figs. 6, 6a) could be interpreted as showing the radial facets pierced by axial canals. His diagram, page 101 (213), fig. 19, and his description on the same page unequivocally indicate the presence of such canals. The actual type specimen (M.C.Z. 1238) shows that such is not the case, however. The specimen has been treated with acid, but the dark matrix filling the ventral grooves of the radials has not been removed in some cases. It is clearly shown that there is a deep, fairly narrow, open groove without a separate axial canal. Again, the articulating facets of the radials are small and quite unlike those of *Gasterocoma* or *Thyridocrinus*. Incidentally, the lumen of the column is pentagonal.

T. patulus agrees well with *T. problematicus* except for the presence of the supplementary plate in the *post IR*. This will be discussed later. Slocum (p. 288) assumed anchylosis of the *IBB*. In closely united circlets of plates the presence or absence of sutures is often a matter of personal opinion, and in silicified specimens such as this usually no sound judgment can be formed.

Relationships.—The most obvious difference between *Thyridocrinus* and *Gasterocoma* is the possession of three infrabasal elements in the former as against the anchylosed circlet in the latter. The well-defined rosette of apposed orals of *Thyridocrinus* is quite at variance with any known tegminal structure in species referred to *Gasterocoma*. The apparently circular columnar lumen of *Thyridocrinus* as judged by the perforation of the *IBB* is quite unlike the quadripartite perforation of *Gasterocoma*. As to the presence of peripheral canals in *Thyridocrinus*, no information is to be had.

Remarks.—Springer (1926, p. 133) recognized a "superficial resemblance" of his species to the Gasterocomidae but stated that "it is definitely excluded from them by its lack of undivided infrabasal disk and peripheral axial canals." On the contrary, the form seems to be linked closely to the Gasterocomidae and furnishes a logical Middle Silurian ancestral structure for the Middle Devonian genera. The tripartite infrabasal circlet is the customary intermediate stage between five *IBB* and an anchylosed ring. The central lumen of the column with peripheral canals occurs elsewhere among the Inadunata and, although interesting structurally, is of doubtful value in defining systematic units. In any event, we do not know the column of *Thyridocrinus*, and the fact that no signs of peripheral canals are shown on the *IBB* is inconclusive, to say the least. In my opinion, the species has no relationship to *Lecythiocrinus*, with which it agrees only in the possession of three infrabasal units and a lateral opening.

Apart from the immediate consideration of structure as applied to *Thyridocrinus* the struc-

ture of the posterior interradius of the Gasterocomidae has far wider implications. We have in effect in these forms an incipient anal tube. We find one or more of the proximal tube plates enlarging and becoming incorporated in the cup. In the case where a single tube plate hypertrophies and becomes fixed in the cup one has a structure that is certainly analogous to that in *Cyathocrinus* and its near allies. Personally, I believe the plates in the two cases to be homologous.

An examination of Schultze's (1866) figures of *Gasterocoma* or, of course even better, an examination of actual specimens will show a great variation in the supplementary plates of the posterior interradius. In the type species, *G. antiqua*, almost any specimen will show one or more plates attached to the *post B* or to the *RR* at the margins of the lateral opening. In better preserved specimens a complete ring of plates is shown, and in one specimen that I have examined the entire opening is covered. In this specimen there is a nipple-like protuberence composed of small plates. The tip is fractured, but evidently there is a small opening that is the anal opening proper. I suspect that a similar structure obtains in Schultze's (1866) plate 12, figure 1C, where both in the figure and in the explanation of the plate the small anal opening is given as piercing the posterior basal.

There is considerable variation in the size and arrangement of these covering plates. In *G. antiqua* the posterior basal seems most often to support two plates. Three plates are occasionally found, and in some specimens there is a single plate extending the full width of the distal face of the basal. The simple plate structure is well shown by Schultze (1866) in pl. 12, fig. 2, in another species, *G. mülleri*. Such a plate is, I believe, comparable to the single plate shown in *T. patulus*, and such a structure does not militate against the inclusion of *patulus* within the genus *Thyridocrinus*. As a matter of fact, *T. problematicus* may have had a similar plate, not so well developed nor so thoroughly incorporated in the cup.

Some years ago (1934, p. 6), in the description of the genus *Corynecrinus* and the establishment of the family Lecythocrinidae, I suggested that the anal tube of *Lecythocrinus* and *Corynecrinus* might well be derived from an incipient anal tube such as is shown in *Gasterocoma*. In these two genera and in *Cestocrinus* from the Mississippian subsequently described (1940) two subequal tube plates rest on *post B*. Whether an anal tube be short or long is of little consequence. The fundamental structures are there in any event. Now I would go even further. In the case of many crinoids with a single plate in the posterior interradius, such as *Cyathocrinus* proper, I think the weight of evidence is strongly in favor of considering it as originally a proximal tube plate. In describing the genus *Zygotocrinus* (1943, p. 644) I stated my belief that the so-called *RA* and *RT* of *Parisocrinus* were originally tube plates. I shall now add the *X* of *Parisocrinus* as having a like origin.

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ENTOMOLOGY.—*The genus* Ollarianus (*Homoptera: Cicadellidae*) *in North America, including Mexico.*[1]

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(Communicated by C. F. W. MUESEBECK.)

The leafhopper genus *Ollarianus* was erected by Ball in 1936[2] to include several similar species from the Southwestern United States and *Eutettix balli* Van Duzee, a Jamaican species, which was designated as the genotype. The species of the genus are similar in color and general appearance. The vertex is short, broad, almost parallel-margined, and rounded to the front. Most species have four black spots in a row between the anterior margins of the eyes. The outer and inner pairs may differ in size in different species or be entirely wanting as in *strictus*. There may be a pair of round black spots on the outer portion of the pronotum and in some species a pair on the scutellum.

In order to identify the Mexican species, which resemble those from the southwestern United States in form and coloration, it was necessary to study the characters of the male genitalia. This study has revealed the fact that although the aedeagi may differ in form among the species of the genus, all have either one or two pairs of pygofer spines, the number, position, and type being definite for any species. Certain species exhibit decided affinities on the basis of genital structures. For instance, *strictus* and *bullatus* can be separated only by the longer ventral spines in the latter species, while *tripartitus* has an aedeagus quite similar to those of *strictus* and *bullatus*. The aedeagi of *ollus* and *vestigii* are almost exactly alike, but the apical spines are entirely different. The aedeagi of *lobatus*, *insignis*, *bidentatus*, and *armus* are similar in type, and each of these species has one pair of ventral pygofer spines. The aedeagus of *rudiculus*, as well as that of *muesebecki*, is unique in type as compared to all the other species.

It is unfortunate that *E. balli* was made the genotype as that species was described from a single specimen from Jamaica that had lost the abdomen. The genital characters for neither sex are therefore known. In spite of this fact, it has seemed advisable to determine and illustrate the specific characters of the other known species and to describe those that have distinct genital characters but that have not been previously treated.

According to present records only one species, *strictus*, is common to both the United States and Mexico. *O. rubianus* Ball is a member of the genus *Eutettix*, while *Exitianus armus* Ball is a member of *Ollarianus*. After studying all the species which have been placed in or assigned to the genus, and examining the genitalia, it seems advisable to include in the genus the described species *balli*, *bullatus*, *strictus*, *rudiculus*, *ollus*, and *armus* and to describe at this time six Mexican species, *muesebecki*, *tripartitus*, *insignis*, *bidentatus*, *lobatus*, and *vestigii*, which are new.

SEPARATION OF SPECIES ON THE BASIS OF GENITAL STRUCTURES

1. Pygofer with one pair of spines.....2
   Pygofer with two pairs of spines.....3
2. Spines basodorsal, especially long...*bidentatus*
   Spines more ventral, much shorter.....
   .....*armus, insignis, lobatus*
3. Ventral pair of spines especially short, inconspicuous.....*strictus*
   Ventral spines longer, conspicuous.....4
4. Aedeagus erect, short, broadened toward apex, and appearing to have three apical processes
   .....*bullatus, tripartitus*
   Aedeagus longer, not broadened apically but usually with a pair of apical processes....5
5. Aedeagus with a dorsally curved, hooked process at apex of elongate, slender ventral portion
  6
   Aedeagus not elongate and slender and without dorsally curved hooked apices.....7
6. Apical pygofer spines short, enlarged at apex, and set with pointed teeth.....*ollus*
   Apical pygofer spines long, slender, with a foot-shaped enlargement at apex....*vestigii*
7. Pygofer spines flat, broad at base, bladelike, aedeagus with a median dorsal projection..
   ..... *muesebecki*
   Pygofer spines not bladelike, broadened near apex to be spearlike, aedeagus elongate, broadened at middle, and constricted just before blunt apex.....*rudiculus*

Ollarianus balli (Van Duzee)

Eutettix balli Van Duzee, Bull. Buffalo Soc. Nat. Hist. 8: 68. 1907.

[1] Received September 29, 1944.
[2] Bull. Brooklyn Ent. Soc. 31: 59. 1936.

A small pale species with a transverse row of four black spots on anterior portion of vertex. Length 4 mm.

Vertex broadly rounded scarcely longer at middle than next the eyes.

Color pale testaceous-yellow, vertex with a transverse row of four black spots between the anterior margins of the eyes. The outer pair is on the ocelli, the median pair minute, the four are about equidistant in spacing. Pronotum with a round black spot behind each eye and a transverse spot on the disk. Scutellum with a pair of median brown spots. Face pale with a pair of minute spots on base. Elytra subhyaline marked with fuscous spots on clavus, disk, and apical areoles smoky.

Genitalia: Nothing is known of either male or female structures.

This species was described from a single specimen from Montego Bay, Jamaica, in 1907, the abdomen of which was missing. In order to determine the identity of this species, which has been made the genotype, it will be necessary to obtain a male from the same locality and determine the male structures by dissection. There is no question about its generic relationship to the other species included in the following pages.

Ollarianus armus (Ball), n. comb.

Exitianus armus Ball, Bull. Brooklyn Ent. Soc. **28**: 227. 1933.

Vertex broadly rounded, about one-third wider between eyes at base than length at middle. Length 3.7–4.5 mm.

Color pale yellowish, a large round black spot next each eye just above margin, a pair of proximal small transverse spots on middle between the larger spots. Pronotum with a large round black spot next each lateral margin behind eye, some smaller markings on disk. Scutellum pale with a black line along each side of apex. Elytra subhyaline, veins dark brown. Face pale with two minute spots on middle of face below margin.

Genitalia: Female last ventral segment slightly excavated each side of a broad median slightly produced lobe, which is embrowned on margin. Male plates triangular, narrowing to slender apices. Styles broad at base rapidly tapered to a pointed, outwardly curved apex. Aedeagus rather short and thick with a pair of rather long pointed apical processes which are directed ventrally. A dorsally produced portion arises at base. There is one pair of spines on pygofer and these arise ventrally at about the middle.

This species has been recorded for southern Arizona only, where it was taken from desert hackberry at Tucson and Superior by Dr. Ball.

Ollarianus strictus (Ball), n. comb.

Eutettix strictus Ball, Can. Ent. **32**: 204. 1900.
Chlorotettix minor DeLong, Ohio State Univ. Bull. **23**: 6. 1919. New synonym.

A yellowish species usually without definite markings. Length 3.5–4 mm.

Vertex broadly roundedly produced, almost twice as wide between eyes at base as median length.

Color yellowish, often washed with gray and usually unmarked. Face pale yellow. Sometimes the vertex has the four characteristic small spots of other species of the genus in a transverse row before the eyes and a pair of small round spots on disc of scutellum.

Genitalia: Female last ventral segment with posterior margin truncate, slightly produced at middle. Male plates broad at base, long, triangular with the acute apices produced and bright orange in color. The styles are rather broad to near apex where they are excavated on the outer margin to form rather pointed apices which are curved outwardly. Aedeagus short, broadened from base to form what appears to be in lateral view three distinct apical portions. In ventral view these appear as lateral protrusions. There are two pairs of spines on the pygofer, a long pair that arises from the dorsal median portion and extends ventrally and caudally. A smaller pair is short and arises on the ventral basal portion of the pygofer.

This species was described from specimens taken in Arizona and it has since been collected in Texas. Mexican specimens have been collected at Hermosillo, Sonora, November 29, 1927 (M. F. 1220); Cajeme, Mexico, November 19, 1935 (M. B. 384); Yaqui Valley, Sonora; Montemorelos, Nuevo León, June 3, 1930 (M. F. 2023); Los Mochis, Sinaloa, May 17, 1930 (M. B. 301); and Eloxochitlan, Oaxaca, June 27, 1932 (M. F. 2638), collected by Dr. Dampf. Specimens were also collected at Tehuantepec, Oaxaca, October 13, 1941, by Caldwell, Good, Plummer, and DeLong.

Ollarianus rudiculus Ball

Ollarianus rudiculus Ball, Journ. Washington Acad. Sci. **26**: 434. 1936.

A pale species with four round black dots in a row across anterior portion of vertex and a pair on scutellum. Length 5 mm.

Vertex broad, rounded, more than twice as wide between eyes at base as median length.

Color pale yellow, a row of four round black spots about equidistant from one another across vertex between anterior margins of eyes. The middle pair is a little posterior to the outer pair. Pronotum with a round black spot on anterior margin, either side just posterior to middle of eye. Scutellum, with a pair of small round proximal spots on disk. Face pale with portions of brownish arcs.

Genitalia: Female last ventral segment truncate, the median third roundedly produced. Male plates broad at base, narrowed, then produced into rather broad apices which are divergent, sloping to outer margin at apex. Styles long and slender, broadened at base but rapidly narrowed and produced to slender produced portions which are sharply pointed at apex. The aedeagus is broadened at middle then constricted before an apical headlike tip. On the dorsoanterior margin a slight enlarged process is formed just beyond the enlarged portion. Two pairs of spines occur on the pygofer. A long pair arises on the dorsal apical portion and extends ventrally. In caudal view they are broad, bladelike and are pointed at apex. A second pair arises ventrally at about the middle of the pygofer and extends inwardly and dorsally.

The specimens from which this species was described were all taken in southern Arizona. It has been collected in Texas by Prof. J. N. and Mrs. Dorothy Knull.

Ollarianus bullatus Ball

Ollarianus bullatus Ball, Journ. Washington Acad. Sci. **26**: 433. 1936.

A black-faced species with four spots across anterior portion of vertex or without vertex markings. Length 4 mm.

Vertex broad, blunt, scarcely twice as broad between eyes at base as median length.

Color, face black, appearing as a black, marginal line from above. The vertex may not bear color markings. In well-marked specimens with a row of four black spots across anterior portion of vertex between anterior margins of eyes. The central pair is larger so that in poorly marked specimens the central pair may persist when the outer pair is not visible. Elytra pale, veins inconspicuous.

Genitalia: Female last ventral segment with posterior margin truncate, with a broad, roundedly triangular median projection. Male plates broad at base, roundedly narrowed to long acute tips. Style rather broad, excavated on outer margin just before outwardly bent and pointed apices. Aedeagus very similar to *strictus* with a broadened apex which appears divided into three apical portions. Pygofer with two pairs of long spines. One pair arises dorsally and basally, and the other arises on the ventral median portion.

This species can be separated from *strictus* by the black face and the long ventral pygofer spines.

All specimens in the type series were from southern Arizona. The collections made by Professor and Mrs. Knull have shown that it occurs in Wickenburg, Patagonia, and the Santa Rita Mountains in Arizona, and in the Davis Mountains and Val Verde County in Texas.

Ollarianus ollus Ball

Ollarianus ollus Ball, Journ. Washington Acad. Sci. **26**: 433. 1936.

Resembling *rudiculus* in form and general appearance but with distinct male genitalia. Length 4–4.6 mm.

Vertex broad, rounded, almost parallel-margined.

Color pale yellow, with four faint black spots in a transverse row between the anterior margins of the eyes. These are sometimes wanting. Elytra slightly smoky in the males with the cross nervures emphasized.

Genitalia: Female last ventral segment with posterior margin nearly truncate, the median third roundedly produced. Male plates narrowed to elongate pointed apices. The concave portion of margins before the tips are heavily margined with black. Style rather broad to near apex where the outer margin is rather deeply excavated forming a narrow fingerlike apex, which is curved outwardly. Aedeagus composed of a ventral straight portion, which has a dorsally curved pointed hook at apex. At the base a dorsal portion is directed dorsally

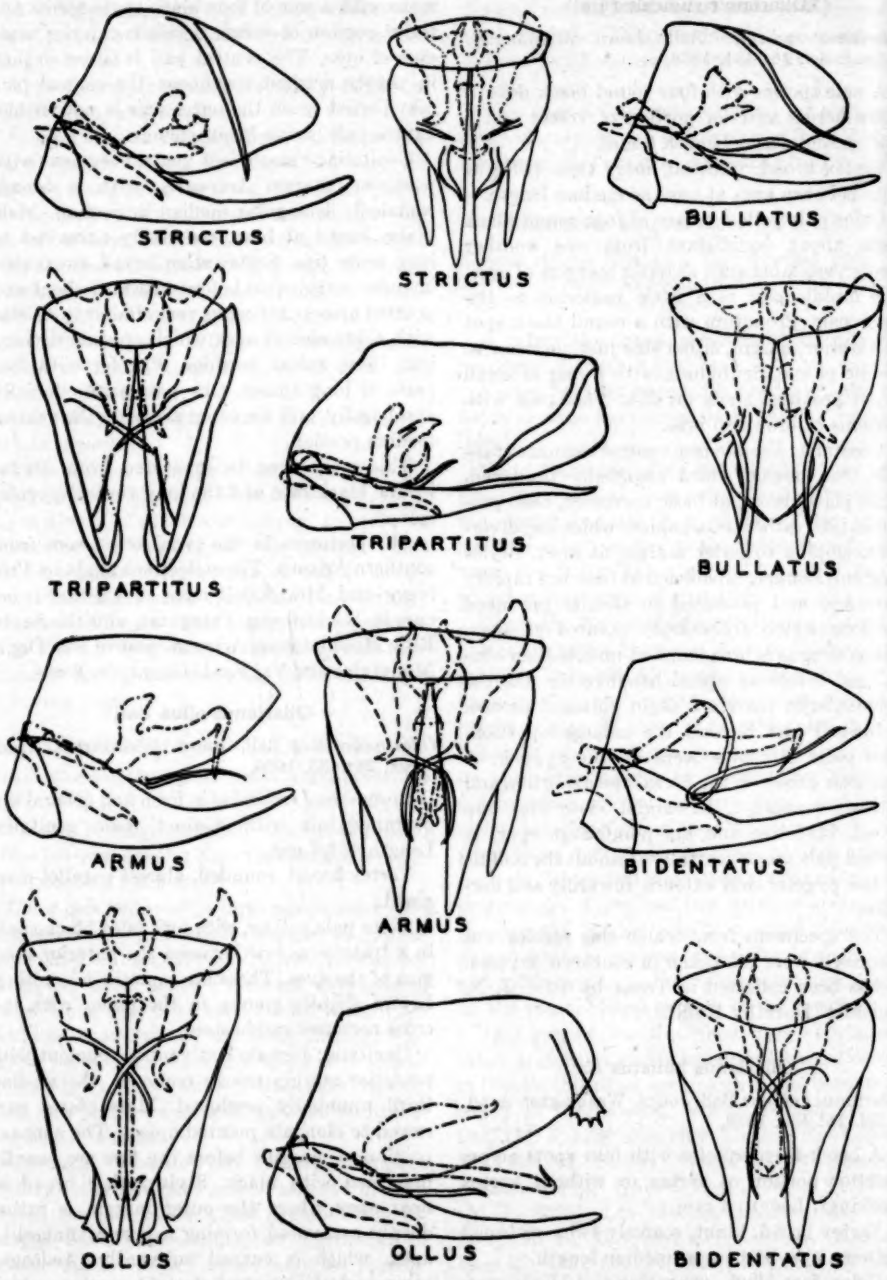


FIG. 1.—Leafhoppers of genus *Ollarianus* Ball: Ventral and lateral views of male genital structures of species as labeled.

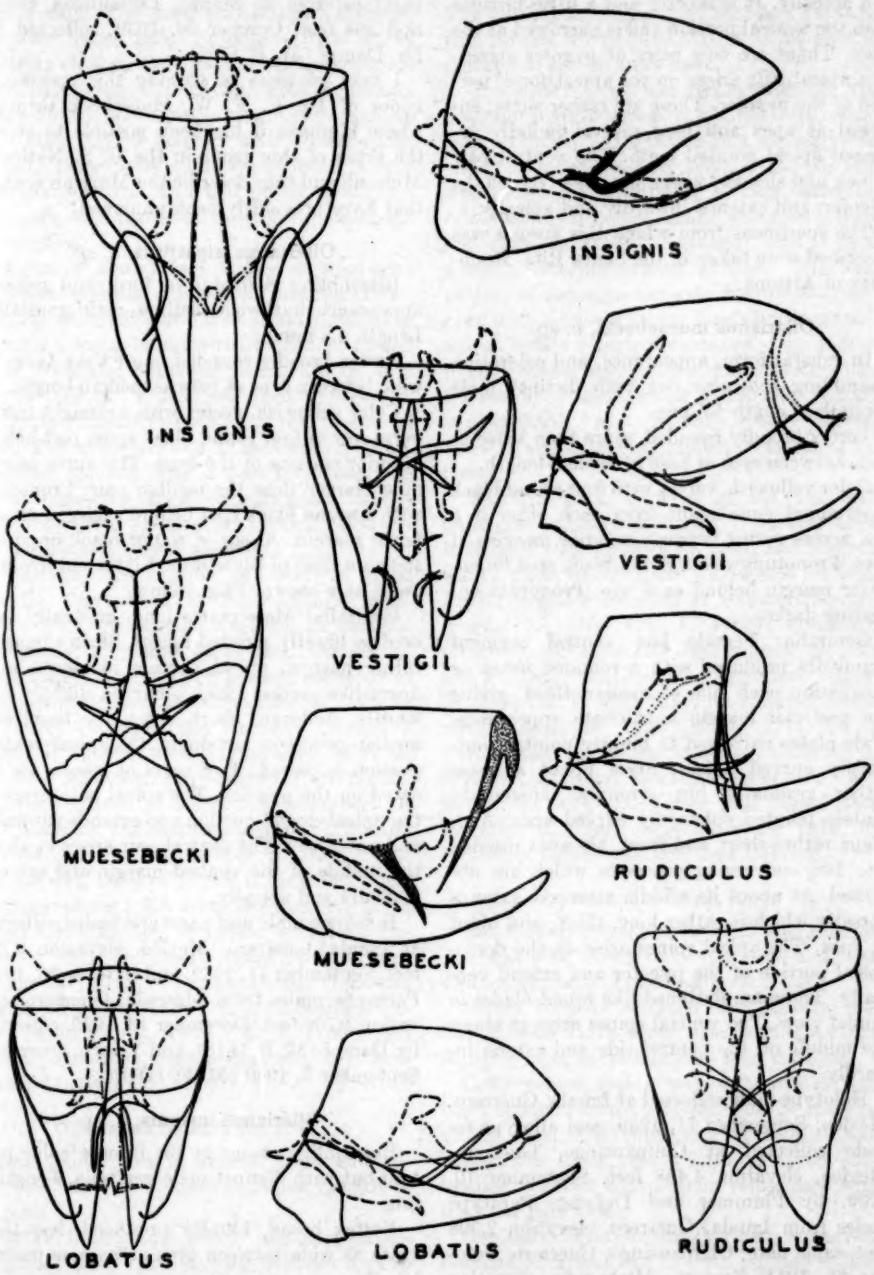


FIG. 2.—Leafhoppers of genus *Ollarianus* Ball: Ventral and lateral views of male genital structures of species as labeled.

and apically. It is shorter and a little broader than the ventral portion and is narrowed at the apex. There are two pairs of pygofer spines. The apical pair arises on the apical dorsal portion of the pygofer. These are rather short, enlarged at apex and bear several radially arranged apical pointed teeth. The ventral pair is long and slender, arises near the base of the pygofer, and extends inwardly and apically.

The specimens from which this species was described were taken in the Santa Rita Mountains of Arizona.

Ollarianus muesebecki, n. sp.

In general form, appearance, and coloration resembling *rudiculus* but with distinct male genitalia. Length 4.5 mm.

Vertex broadly rounded, more than twice as wide between eyes at base as median length.

Color yellowish, vertex with four round black spots about equidistant from each other in a row across vertex between anterior margins of eyes. Pronotum with a round black spot on anterior margin behind each eye. Pronotum appearing darker.

Genitalia: Female last ventral segment roundedly produced with a rounded notch or excavation each side of median third, giving the posterior margin a trilobate appearance. Male plates narrowed to bluntly pointed, outwardly curved apices. Style broad at base rather gradually but strongly tapered to acutely pointed outwardly curved apex. Aedeagus rather short and erect, the apex divided into two converging processes which are upturned. At about its middle a process extends dorsally which is rather long, thick, and blunt at apex. The apical spines arise on the dorsoapical portion of the pygofer and extend ventrally. These are flattened like broad blades in caudal view. The ventral spines arise at about the middle on the ventral side and extend inwardly.

Holotype male collected at Iguala, Guerrero, Mexico, September 11, 1939, and allotype female collected at Chilpancingo, Guerrero, Mexico, elevation 4,488 feet, September 10, 1939, by Plummer and DeLong. Paratype males from Iguala, Guerrero, elevation 2,398 feet, same date; Chilpancingo, Guerrero, October 25, 1941; Zamora, Michoacán, elevation 5,140 feet, October 2, 1941, all collected by Plummer, Good, Caldwell, and DeLong. A paratype from El Mante, Tamaulipas, elevation 264 feet, October 26, 1930, collected by Dr. Dampf (M. F. 1775).

I take pleasure in naming this species in honor of Dr. C. F. W. Muesebeck through whose kindness it has been possible to study the types of this genus in the U. S. National Museum and thus describe the Mexican species that have previously been unnamed.

Ollarianus tripartitus, n. sp.

Resembling *rudiculus* in form and general appearance but with distinct male genitalia. Length 4.5 mm.

Vertex broadly rounded, more than twice as wide between eyes at base as median length.

Color yellowish, vertex with a straight transverse row of four round black spots just before anterior margins of the eyes. The outer pair is much larger than the median pair. Pronotum with a round black spot behind each eye on anterior margin. A pair of round black proximal spots on disk of scutellum. Elytra subhyaline, veins pale brown. Face yellow.

Genitalia: Male plates long, gradually tapered to bluntly pointed apices. Style elongate, rather narrow, apical portion narrowed to a finger-like process which is curved slightly outwardly. Aedeagus short, erect, the basal and median processes are single, the apical-ventral portion is paired. Two pairs of spines are located on the pygofer. The apical pair arises on the apical dorsal portion and extends ventrally and anteriorly. The ventral pair arises at about the middle of the ventral margin and extends medially and apically.

Holotype male and paratype males collected at Iguala, Guerrero, Mexico, elevation 2,398 feet, September 11, 1939, and October 25, 1941. Paratype males from Mexcala, Guerrero, elevation 1,706 feet, December 13, 1929, collected by Dampf (M. F. 1513), and Veinco, Guerrero, September 3, 1940 (M. F. 1790).

Ollarianus insignis, n. sp.

Resembling *armus* in the intense color pattern but with distinct male genitalia. Length 5 mm.

Vertex broad, bluntly produced, less than twice as wide between eyes at base as median length.

Color gray, vertex with a transverse straight row of four black spots between anterior mar-

gins of eyes. The outer pair of spots is larger than the inner pair. Pronotum with brown mottling on disk, the humeral angle almost entirely covered by a large black spot. Scutellum pale with two black spots along outer margin on each side. Elytra marked with brown spots. Usually three pairs along commissure, a spot each side on disk and tips of elytra smoky. Face pale with two small proximal spots on upper portion.

Genitalia: Female last ventral segment with posterior margin sloping to median third, which is roundedly produced. Male plates long, strongly concavely narrowed to slender apices. Style gradually narrowed from base to form narrow apices, which are bent outwardly. Aedeagus rather short with a dorsal process at base. The main portion of aedeagus curved, extended apically with a pair of rather long apical spines extending ventrally and laterally. A pair of pygofer spines arises ventrally at about the middle and curves apically.

Holotype male collected at Puente de Ixtla, Morelos, December 27, 1929 by Dampf (M. F. 1557). Allotype, female, collected at Zamora, Michoacán, elevation 5,140 feet, October 2, 1941. Paratype males and females collected at Acapulco, Guerrero, elevation 328 feet, October 24, 1941; Chilpancingo, Guerrero, elevation 4,488 feet, October 25, 1941; Jiutepec, Morelos, elevation 3,500 feet, September 6, 1939; Iguala, Guerrero, elevation 2,398 feet, October 22, 1941; Zamora, Michoacán, elevation 5,140 feet, October 2, 1941; Tehuantepec, Oaxaca, elevation 328 feet, October 13, 1941; Mexcala, Guerrero, elevation 1,706 feet, October 22, 1941; Guadalajara, Jalisco, elevation 5,051 feet, October 3, 1941; Puente de Ixtla, Morelos, December 27, 1929; Pungarabato, Guerrero, August 22, 1930 (M. F. 1769); Zincauro, Guerrero, September 2, 1930 (M. F. 1789); and Paxtial, Guatemala, elevation 660 feet, September 14, 1925 (M. F. 807).

Ollarianus bidentatus, n. sp.

Resembling *ollus* in general form and appearance but with distinct genitalia. Length 4–4.5 mm.

Vertex broad and blunt, almost parallel-margined, about twice as wide between eyes at base as median length.

Color yellow with the usual row of four black spots between the anterior margins of the eyes. The outer pair is large and rounded, the inner pair minute. Scutellum with a small spot on either side not far from apex.

Genitalia: Female last ventral segment with posterior margin truncate, median third roundedly produced. Male plates long, strongly concavely rounded on outer margins to form long slender apices. Style broad at base, narrowed rather abruptly before middle, the apex pointed and bent outwardly. Aedeagus with a short dorsally directed process at base. The main portion of aedeagus elongate, narrowed toward apex with a pair of rather long slender pointed apical spines directed ventrally. One pair of pygofer spines arises on the dorsal portion near the middle. These are long and slender, extending ventrally and medially, then curving apically and extending almost to apices of the plates.

Holotype male, allotype female, and male paratypes collected at Iguala, Guerrero, elevation 2,398 feet, October 25, 1941, and September 11, 1939, by Plummer, Good, and DeLong. Paratype males collected at Balsas, Guerrero, August 15, 1930 (M. F. 1754); Zirandaro, Guerrero, elevation 639 feet, August 29, 1930 (M. F. 1786); San Geronimo, Guerrero, August 30, 1930 (M. F. 1787); Coyuca-Catalon, Guerrero, August 24, 1930 (M. F. 1771) by J. Parra; male paratypes were also collected at Jiutepec, Morelos, elevation 2,500 feet, September 6, 1939, and Valles, San Luis Potosí, elevation 312 feet, September 24, 1941, by Plummer, Good, Caldwell, and DeLong.

Ollarianus lobatus, n. sp.

Resembling *bidentatus* in form and appearance but with vertex more produced and with distinct genitalia. Length of male 5 mm.

Vertex broadly rounded and bluntly produced, basal width about twice median length. A little longer at middle than next the eyes.

Color yellow with a transverse row of four black spots on vertex between anterior margins of the eyes. The outer pair is rounded and larger. The inner pair is minute. Elytra subhyaline without conspicuous veins, face with traces of pale arcs.

Genitalia: Male plates rather long, concavely rounded on apical half to form pointed apices. Style broad at base rapidly narrowed to narrow, pointed outwardly bent apices. Aedeagus with a dorsally extended lobate structure at

base. The main portion is curved, directed apically and bears a pair of rather long laterally directed spines at apex. Pygofers with a pair of ventral spines arising not far from base which extend inwardly and curve apically.

Holotype male collected at San Geronimo, Guerrero, August 30, 1930, by J. Parra (M. F. 1787).

Ollarianus vestigii, n. sp.

Resembling *strictus* in general form and appearance but with distinct male genitalia. Length 4–4.5 mm.

Vertex broad, bluntly produced, more than twice as broad at base as median length.

Color, vertex yellow with faint traces of the four black spots on anterior portion between eyes. The median pair is most easily recognized. Pronotum dull gray. Scutellum with a transverse row of minute round spots across disc. Elytra subhyaline with dark brown veins especially the apical cross veins, which are conspicuous. Three pairs of brown spots along commissure on clavus and small brown spots on base, corium, and posterior clavus. Apical portion smoky.

Genitalia: Female last ventral segment with posterior margin truncate, median third rather broadly, roundedly produced with a brown mark at middle and one either side of produced portion. Male plates elongate, triangular, tapered to acute, pointed apices. Style long, narrowed near base, apical portion excavated on outer margin and curved outwardly. Aedeagus composed of a long slender ventral portion which is curved dorsally and bears a hook at apex. A shorter but slightly thicker portion arises at base and curves dorsally. The pair of apical pygofer spines is elongate, slender, and broadened to form a footlike apex. The ventral pair arises basally, is rather long, and extends inwardly.

Holotype male, allotype female, and female paratype collected at Palomas, San Luis Potosí, October 12, 1931, by Dr. Alfonse Dampf (M. B. 338).

This species can be separated from *ollus* to which it is apparently closely related by the longer apical spines, which are broadened at the apex to form a footlike structure, and the absence of the ventral pygofer spines.

ENTOMOLOGY.—*Studies on flower flies (Syrphidae) in the Vienna Museum of Natural History.*[1] F. M. Hull. University of Mississippi. (Communicated by Alan Stone.)

This paper presents the final study of some syrphid flies from a small collection submitted to the author in 1936 through the courtesy of Dr. Hans Czerny, whom I wish to thank for the opportunity of studying them. Other short articles have described species from this material from time to time. The types of the flies here described were deposited in the Naturhistorischer Museum in Vienna in 1938.

Genus **Baccha** Fabricius

Baccha ariela, n. sp.

This species is readily recognized by the large, central, irregular triangle of brown upon the middle of the wing, which connects broadly with the complete, anterior border of brown. Related to *clarapex* Wiedemann.

Female.—Length 11 mm; wing 10 mm. *Head:* hemispherical. The vertex and front are dark, shining brown, obscured by mold, probably violaceous in life. The large, shield-shaped, light-brown area before the antennae contains a small shining black spot. The antennae are widely separated and short. The third segment is thick and rounded. The face is rather prominent; the very large tubercle juts barely farther than the antennal prominence. The antennae are dark brown. The arista is short and thickened and black. The face is light reddish brown or yellow. The tubercle is dark brown and diffuse. From the lower part of the tubercle, along the oral margins of each side, there is a narrow blackish stripe running to the black cheeks. The cheeks posteriorly and along the oral margin are dark brown. The extreme lower occiput along the oral margin is light brown. The eyes are strongly excised just above the middle, silver-pubescent and scalose-pilose. The occiput behind is quite concave, so that the head fits well over the thorax and is very much wider than the thorax. *Thorax:* the dorsum is dully shining black with a strong

[1] Received July 31, 1944

violet cast. The sides, in a stripe almost as wide as the humeri and uninterrupted at the suture, are light ochre-brown. The pleura are entirely light yellowish brown. The humeri apparently are bare, but with some very short pubescence. The scutellum is entirely light coffee-brown, dully shining. There is no scutellar fringe, but it may have been rubbed away. *Abdomen:* strongly spatulate; the sides of the fourth segment are parallel and three times as wide as the middle of the second segment. The end of the second segment is one and two-thirds or one and three-fifths as wide as the middle. The extreme base of the abdomen is twice as wide as the narrow part of the second segment. The base of the second segment is little wider than the narrowest part. The end of the fifth segment is two-thirds as wide as the base of that segment; sixth segment small. Abdomen obscured by mold; it appears to be dark reddish brown, with obscure yellow spots that are palest on the fourth segment, and triangular in shape in the anterior basal corners. There are very dark opaque brown cross bands present; these are rather wide and begin on the posterior, lateral margin and are directed obliquely toward the anterior middle of the segment and meet very broadly in the middle. This is the arrangement on third and fourth segments. The second segment in the middle has a large, opaque, cone-shaped spot of the same color as the cross band. The pile of the abdomen is quite appressed and black. The halteres are pale orange. The squamae are whitish with yellow margins. *Legs:* the first and second femora and tibiae are light orange-brown or yellow, paler at the apices and bases of femora and tibiae, respectively. All the tarsi are dark brownish black. The bases of the hind tibiae are pale yellow. *Wings:* hyaline, except for extensive brown patterns. There is no stigmal cross vein; the vena spuria is faint; wings villose. The alulae are well developed. The entire anterior margin of the wing above the third vein is dark brown; this brown color descends basally to fill the first and second basal cells or slightly below them, to fill the basal anterior corner of the first posterior cell, nearly the basal half of the discal cell, and the basal half of the posterior to the discal cell.

Holotype.—A female, from Brazil (collection of Winthem).

This species was figured in the review of *Baccha* by the author, in Entomologica Americana **23**: 89, fig. 49. 1943.

Genus Microdon Meigen

Microdon (Omegasyrphus) biluminifera, n. sp.

Characterized by the slender form and the large hyaline spots at the base of the brownish abdomen. Related to such species as *baliopterus* Loew.

Male.—Length 12 mm exclusive of antennae; wings 10.2 mm. Antennae 2.5 mm. *Head:* short, much wider than the thorax. The ocelli are raised into a very conspicuous, round, subglobose, vertical dome, in front of which is a marked crease. The front, beginning at this crease, is rather short and barely longer than the second antennal segment. The antennae are thus set high upon the head; they are elongate. The second segment is barely longer than wide, the third segment nearly five times as long as the second and the first segment about as long as third, or barely longer. The third segment is subtruncate and flattened at tip, widened in the middle, with a lateral crease and with a deeply thickened arista, which is only two-thirds the length of the segment. First two segments dark brown, third lighter. The vertex and the front and upper part of the face are very dark shining brown, the lower part of the face and cheeks light shining brown. There is a thick band of silvery-yellow pile on the lower sides of the face which is continued narrowly up the sides of the face, not quite to the level of the antennae. There is a bare shield-shaped spot above the antennae. The eyes are bare. *Thorax:* very dark brown and covered with an appressed, setaceous-black pile; and on the suture there is a band of flattened, pale, brassy pile and similar flattened pile in the posterior part of the midline, which is directed posteriorly and meets a broad, semicircular area of similar pile lying just in front of the scutellum and which is directed forward so as to intermesh with this. The scutellum is light brown, shining, roughly triangular on its posterior margin and terminates in two tiny, very close-set points. Humeri pilose. The pleura have a row of pale, sericeous, stiffened hairs. The metanotum is conspicuous and large. The halteres are orange, the squamae pale brown. *Abdomen:* rather elongate, a little wider than the thorax; nearly four times as long as wide. The sides of the last two segments are nearly

parallel but practically cylindrical; they are barely wider at the base of the third segment. The second segment is only a trifle wider in the middle than the third segment but is much flattened, especially over an area corresponding to the spots, which are actually concave. The lateral, ropelike margin on the second segment is thick and prominent. The first segment is rather short, with a deep crease between it and the second segment. The second segment is neither cylindrical nor flat; it is rather inflated and marked on each side with a large, posteriorly pointed, anteriorly broad, quite hyaline spot, which is continuous on the sides with the translucent yellow margins and which is divided in the middle by a roughly triangular, black spot; its base lies on the posterior margin of the segment, its peak is narrowly continuous with the first segment. The remainder of the abdomen is very dark brown and densely appressed-setate with crevices for the setae; on the posterior margin of the third segment, not reaching the sides, there is a band of flat, golden, posteriolaterally directed pile, which is widely separated in the middle. A similar band on the fourth segment is equally separated, beginning about the middle of the segment, and obliquely directed away toward the posterior corners, after first being directed toward the midline. The hypopygium is perfectly rounded. *Legs:* light orange-brown, becoming almost golden yellow on the tibiae and tarsi. The hind femora are a little thickened, especially on the scar a third of the way from their bases. The thickening gradually extends throughout the remainder of each femur. There are no ventral spines. The last half of each of the hind tibiae is rather thick, ending simply, with an oblique scar in the middle. *Wings:* considerably longer than the abdomen, very pale brown and thickly pilose. The spurious vein is chitinized, the posterior veins are brown; the anterior veins yellow, the stigmal cell pale yellow, the costal cell and the small area past it also yellow.

Holotype.—A male, from Espirito Santo, Brazil (collection of Fruhstorfer).

Microdon (Omegasyrphus) baliopterus Loew brunnipennis, n. var.

Male.—Length 9.5 mm without antennae; wing 7.2 mm. *Head:* hemispherical and a little wider than the thorax. The vertex is swollen, convex, and purplish coppery; the sides of the face are parallel. The face is quite convex, slightly violaceous, and narrower than in *baliopterus* Loew. The first segment of the antennae is light brown and about four times as long as wide; the second segment is light brown and about a fourth as long as first segment; third segment missing. *Thorax:* dark shining black with very obscure violaceous vittae. The scutellum is shining, with a violaceous cast and two small points upon the rim, which are much shorter and somewhat farther apart than in *baliopterus. Abdomen:* of the same type of coloration as in *baliopterus* but without any black upon the sides of the third and fourth segments. *Legs:* entirely light brownish red and but little darker on the femur; the basal scar is much less prominent than in *baliopterus.* The halteres are almost white instead of deep orange-brown. The squamae are white, but are yellow to orange in *baliopterus. Wings:* the pattern of the infuscation of the wings is similar to that of *baliopterus,* but the bulge in the lower vein seems to be less conspicuous. The dark markings seem to be more uniform and less diffuse in the centers of the cells.

Holotype.—A male, from St. Thomas, Guatemala (Alte Sammlung).

Originally, I held this fly to be distinct from *baliopterus;* I now believe it better considered a variety for the present; the species of *Microdon* seldom have a large range, and this must be considered quite an extension of the range of *baliopterus.*

Genus **Merodonoides** Curran

Merodonoides czernyi, n. sp.

Related to *circularis* Curran, this species is distinguished by the chiefly reddish femur and a different pattern of eye stripes.

Male.—Length 11.5 mm; wing 6.5 mm. *Head:* large and somewhat broader than the abdomen. The eyes are bare and red-brown, with four vertical stripes; the posterior stripe lies on the margin of the eye, is smooth-edged and continuous; the other three are equally spaced but quite irregular and become very slender and disappear ventrally and are partly broken up into spots. The vertex is dark brown, the upper front black and covered with light yellowish-brown pubescence; the eyes are barely approximated, not actually touching; the lower front, except from the narrow, shin-

ing black rim to the antennal prominence, is shining black and densely covered with yellowish pubescence. The face below the antennae is covered everywhere, except from the facial knob and a narrow continuation of the knob to the epistoma, with pale pubescence and thick, rather long, shiny, yellowish pile; this pile and pubescence are omitted on the extreme lower face and cheeks. The antennae are fairly large. The third segment is a little over one and one-half times as long as wide; it is rounded apically and is pale orange and has narrow, dark, dorsal margins; the first two segments are slightly darker. The arista is basally thickened, barely longer than the antenna, and pale orange. *Thorax:* the ground color is feebly shining and very dark brown; on the mesonotum are four wide, black vittae; the outer pair is not interrupted at the suture, the inner pair is slightly closer than the separation between outer and inner stripes. The stripes do not reach the scutellum. The scutellum is large, broad, two and one-half times as wide as long, with subtruncate rim and feebly impressed rim; its color is light reddish brown. The pile of the thorax, scutellum, and humeri is light yellowish, becoming golden on the scutellum. *Abdomen:* not quite twice as long as wide, rather thick; the terminal segments are cylindrical, with a large hypopygium. The base of the fourth segment is three-fifths as wide as the widest part of the second segment close to the base. From near the base of the second segment the abdomen tapers gradually down to the end of the third segment. The first segment is gray; the second segment has a narrow but conspicuous black basal border and just before the apex a wider, dark brown band that is produced obtusely forward in the middle and not quite touching the anterior black band, and instead of brown in the middle of this band there is an oblong, elongate black spot. The remainder of segment is light brownish yellow. The third segment is similar in color without any black band and with the posterior brown band vague in form and in outline. The entire basal three-fifths of the fourth segment, except for narrow, small triangles in the lateral corner at the base, is dark brown; the remainder is light yellow. The pile of the abdomen is pale yellow to reddish brown according to the area. *Legs:* almost entirely light reddish brown, with an irregular black band in the middle of each of the thick hind femora which disappears toward the top half of the femora. On the inside of each of the front femora there is a small, basal, black spot; the apical portion of each of the front femora and all the front and middle tibiae and the extreme base of the hind tibiae are light yellow. The tarsi are light reddish. The apical spines of the femoral and basal patch of setae are black; otherwise the pile is pale. *Wings:* short and broad, the veins outlined in dark brown; remainder of the wings pale brown; a stigmal cross vein is present and beyond it a brown stigma, which is a little longer than wide. The spurious vein is chitinized. The wings apparently lack villi.

Holotype.—A male, from Tonkin, Montes Mauson, April–May, 2,000–3,000 feet (H. Fruhstorfer).

Genus **Mallota** Meigen

Mallota brevipila, n. sp.

This fly is characterized by its pale pink or reddish color on the abdomen, its whitish pile, and the slender black fascia on the abdomen. Apparently it is not closely related to other described species of *Mallota*.

Male.—Length 11 mm. *Head:* eyes bare, the vertex dark brownish black with yellowish-gray pollen and pale yellowish-white pile. The front is similarly colored; the pollen is yellower and somewhat sparser in the middle, particularly in front of the antennae; the dark-brown ground color of the front is thus allowed to shine through. The front is narrowly yellowish brown just in front of the antennae; the pile of the front and face is yellowish white. The eyes are rather widely separated in the male but are angularly produced toward each other. The width between them is as great as the distance between the posterior ocelli. The face is dark brown, thickly covered with yellowish-white pubescence, which is a little thinner on top of the well-developed tubercle and appears to have been rubbed off. The face is deeply concave beneath the antennae, and the cheeks are dark shining brown and largely bare. The antennae are dark brown. The third segment is wider than long, the first two segments equal. The arista is light yellow and thickened throughout its length; the apex, however, is sharpened. *Thorax:* brownish black and thickly covered with light brownish-gray pollen and thick but short, almost white pile. There is

a thin band of brownish-black pile across the middle between the wings. The pile of the postcalli, of the scutellum, and of the mesonotum in front of the scutellum is entirely whitish. The pleural pile is abundant and white. The squamae and their border and fringe are yellowish white. *Abdomen:* the first and second segments are almost entirely light red, becoming orange upon the lateral margins. The posterior border of the first segment exclusive of the posterior corners is, however, gray with yellowish-white pubescence. On the posterior part of the second segment near the posterior margin there is a somewhat darker brown, narrower fascia, which fades into light red as it approaches the lateral margin; the posterior margin is narrowly yellowish white with similarly colored pubescence and pile; the pile of both of these two segments is entirely white and becomes slightly more yellowish in the middle of the second segment. The third segment is light red; its posterior and anterior margins are narrowly yellowish white and pollinose, and on each side of these fasciae there is a slender, transverse fascia of black; the black fascia laterally fades into red on each side at a considerable distance from the lateral margin. Between the black fascia the segment is red. The fourth segment is dully shining black; upon it there is a trace of a basal, lateral, linear, yellowish-white pubescent fascia on each side of the segment. Lying within this black area on each side there is also a trace of a red, diffuse obscure fascia, which continues laterally into the reddish lateral margin. The posterior margin is broadly yellowish-white-pollinose. The hypopygium is shining black and white-pilose. The pile of the third and fourth segments is black on the posterior black areas and yellowish in front of the black areas and white elsewhere. The pile of the abdomen is much shorter than is characteristic for the genus *Mallota* and is rather short and setaceous and subappressed posteriorly on the second to the fourth segments. *Legs:* the first four femora are dark brown; their tibiae are brownish black in each case upon the apical half and yellowish brown basally. The tarsi are light brown. The hind femora are moderately thickened and are light orange-brown upon the lateral surface for the basal two-thirds and upon the dorsal surface for the basal two-fifths; elsewhere, except at its extreme apex, it is brownish black; its pile is long, abundant, and whitish, except for a ventral patch of black, appressed setae near the apex and except for a thick patch of longer, erect, black bristles ventrally near the base and a little more toward the medial surface. The hind tibiae are brown, and darker brown laterally upon each apical third. The tarsi are dark brown. *Wings:* nearly hyaline, the marginal cell widely open.

Holotype.—A male. One paratype male. Both from Turkmenien. Paratype in author's collection.

Mallota apimima, n. sp.

This species is related to *salti* Curran but is distinguished by the wholly black legs, and it is separated from *colombii* Macquart by the yellow pilose abdomen.

Male.—Length 15 mm. *Head:* the eyes touch quite narrowly at a point on the upper part of the head leaving the vertical triangle less than half as long as the front. The eyes are thick white-pilose and the vertex is feebly shining black with thick, long, black pile. The front is polished, shining black with sparse, long, yellow pile on the sides and a few long, black hairs at the top and through the middle. The face and cheeks are shing black with sparse, long, pale, pale yellowish pile that becomes dark brown to black in front of the cheeks. The anterior part of the cheeks and adjacent posterior part of face covered with a broad band of sparse white pubescence, which runs from the eye margin to the epistoma. The face is thus left broadly bare; the concavity below the antennae is rather deep, the tubercle low and broad. The first two segments of the antennae are black and black-pilose; the third segment is very dark reddish brown, obliquely oval, and a little longer below. The arista is pale yellow, thickened on the basal half. *Thorax:* mesonotum opaque black covered by dense brownish-black pollen. Across the mesonotum in front of the suture there is a band of dense, deep, yellow pile, which on the two sides is continued on to the humeri and the upper part of the mesopleura. Most of the mesopleural and all the pteropleural pile is brownish black. The pile on the posterior half of the mesonotum behind the suture and on the postcalli is blackish, the hairs apically becoming brown. There are just a few long yellow hairs immediately in front of the scutellum. Scutellum opaque reddish, or

sepia-brown with very long and very dense brownish-yellow pile. *Abdomen:* black, opaque upon the first two segments and shining black upon the remainder of the abdomen. The pile of the abdomen is thick, long, subappressed and brownish yellow on the whole of the second and third segments, except that there is considerable purplish-brown to blackish pile in the basal corners of the second segment and narrowly upon the sides of the first and second segments. The pile of the fourth segment is long, quite sparse, and light yellow. *Legs:* black and largely shining with black pile that becomes dark purplish brown upon the femora. The hind femora are only moderately thickened, the greater part of the thickening being found on the basal two-thirds. *Wings:* strongly tinged with brown; the interiors of the cells are more pale centrally, but there is a large, extensive, diffuse, brown blotch in the center of the wing. The apical half of the first basal cell has a diffuse, longitudinal, nearly hyaline bar down its middle, and there is a similar bar down the middle of the basal half of this cell.

Holotype.—A male, and one paratype male, from Venezuela. Paratype in author's collection.

Genus **Cerioides** Rondani

Cerioides rubrobrunnea, n. sp.

This species is related to *kerteszi* Shannon, from which it is distinguished by the reddish antennal prominence, and reddish third antennal segment, besides differences in the pattern of the wing.

Female.—Length 19 mm; antennae 5 mm; wing 14 mm. *Head:* the vertex is rather swollen; the ocelli are tuberculate; the occiput is not greatly produced behind the eyes near the vertex. There is a strong sunken depression just before the ocelli, and sublunate areas of opaque black lie at the top of the front along the eyes. The vertex and the front and upper face, except about the antennal process, are shining black with a slight bluish cast. The whole lower half of the face, from above the lower level of the eyes, as well as the cheeks and lower occiput, the antennal process, the third antennal segment, and a spot below the process are all light reddish or coffee-brown. The first and second antennal segments are dark brown to blackish. The apical half of the style is white. The antennae are elongate; the process is long, nearly as long as the slender first segment. The second segment is three-fifths the length of first and third segments; without the style it is a little longer than the second. The style is two-fifths as long as the second segment. On the black area of the face there is one pair of roundish spots of thick silver pubescence, and there is another pair a short distance farther down on the sides by the eyes. The face has a small rounded tubercle well below the eyes, and the face is deeply produced and slightly pointed at the apex of the epistoma. *Thorax:* unusually convex from any angle; it is entirely shining, slightly bluish black with, in certain light only, an overlay of vague, silver pubescence, and a vague, small, brown spot of the same lying longitudinally on the posterior half of the thorax in the middle. The thorax is quite scrobiculate. The scutellum is broad, short, rounded, and the basal margin and apical margin are light clay brown; its middle is bluish black, the surface scrobiculate. The metanotum is well developed and very steep. The halteres are pale yellow, humeri very prominent and convex; squamae white, brown-fringed. The pleura are entirely black, silvery pubescent in places. *Abdomen:* very strongly constricted basally; the apex of the second segment is barely wider than the base of the first; the second segment is only a little more than two-thirds longer than the first segment. The base of the second segment has a conspicuous, translucent, pale-brown band, which is narrowly interrupted in the middle. The second segment at its narrowest width is scarcely more than a third as wide as the posterior part of this segment. It is a little less than half as wide as the base of the first segment. Between the end of the second segment and the beginning of the third segment is a crease and a constriction, and the second segment expands suddenly and gradually into a beautifully rounded semicylindrical body, which reaches its maximum at the end of that segment and then tapers off into the long, slender fourth segment, which is one-half longer than the third segment and which, at its tip, is only half as wide as the end of the second segment. The fifth segment is drawn out into a blunt point. The entire remainder of the abdomen, the yellow basal annulus excluded, is dull shining black, with a very faint bluish cast and a heavily scrobiculate surface. *Legs:*

hind legs entirely dark brown, the basal half of the fore and middle femora deep reddish brown, the fore and middle tarsi light orange-brown; elsewhere the legs are dark brown. *Wings:* quite elongate and pointed; longer than the abdomen with the anterior border of the wing past the middle light orange-brown. The posterior basal half of the wing is of the same color. The posterior, apical half of the wing is quite pale brown, nearly hyaline and has a strong, rich, dark brown stripe running from the base of the wing to the apex; it includes the costal cell, the two cells beneath, and the entire upper half of the cell containing the spurious vein; it is delimited by this vein and by the upper outward half of the cell above.

Holotype.—A female, from Muzo, Colombia, 400–800 meters (collection of Fassl).

Cerioides polistiformis, n. sp.

This species is related to *facialis* Kertesz, from which it is distinguished by the yellow posterior fasciae on several of the segments of the abdomen and by the pattern of the face and wing.

Female.—Length 15 mm; antennae 4.5 mm; wings 14 mm. *Head:* the vertex is slightly raised and considerably developed behind the eyes; it is dark, dull shining black. The upper front has two sublunate impressions. The antennal prominence or process is two-fifths as long as the first segment. The front and face and cheeks are everywhere shining black, except that beginning a short distance beneath the antennal process there is a pair of rather slender, light yellow, vertical stripes, which are a little wider apart at the top than they are at the tubercle, and they continue to converge toward the epistoma but do not meet. The antennae are very elongate; the process and first two segments quite black, somewhat shining and deep black, flat-appressed-pilose. The base of the third segment is deep, rich red. The remainder of this segment is grayish brown, only the extreme tip of style white. The face has a rather prominent knob, though it is scarcely tuberculate, which lies below the eyes. The face is rounded, pointed, and considerably produced downward. *Thorax:* dull, shining black with papillose pile, which is exceedingly short. The black of the thorax is overlaid with very dark reddish-brown pollen, quite obscure and a little more evident where it forms a wide median vittae; in some lights the pollen appears to cover all the dorsum, leaving the sutures and a short abbreviated stripe at the inner ends of the sutures outlined in black. The scutellum is black and shining, with a narrow, brownish-yellow margin, scarcely visible above. The metanotum is conspicuous. *Abdomen:* elongate and pointed at the tip; the second segment is quite conspicuous, the end of the second segment is a little wider than the base of the first, and the base of the second segment is a very little wider than the narrowest part of this segment. The second segment is very little longer than the third segment. Third and fourth segments equal. Fifth segment small and pointed. The narrow lateral margin of the anterior half of the second segment and a conspicuous though fairly narrow, posterior margin on the second segment which is widest in the middle and upon the sides, and together with a similar slightly wider, uniform band upon the posterior margin of the third and fourth segments, are all yellow. Upon the third and fourth segments there are middle bands of yellowish-gray pollen, punctate and well interrupted in the middle, and on the fourth segment these bands are sublunate, their inner ends pointed, and the concave surface directed anteriorly. *Legs:* largely dark brown. The lateral surface of each of the fore-femora, the ventral surface of the midfemora, all the hind femora, the hind tibiae except their apices, the midtibiae except their apices, and the foretibiae except their bases are all very dark brown. The remainder of the legs are light orange-brown. The ventral spines of the rather slender hind femora are double-rowed, run the entire length, are rather long, sparse, black, and exceedingly sharp. *Wings:* the anterior margin of the wing above the third vein is brown, and the third vein is narrowly margined with brown posteriorly; also the upper half of the first basal cell is brown. The brown of the submarginal cell, and of the distal portion of the stigmal area of the subcostal cell, is considerably darker in color. The third vein emits a downward, oblique spur vein, and at the point of emission it is angularly but shallowly kinked; third vein and subapical cross vein confluent practically at wing apex.

Holotype.—A female, from Cuesta de Cillutincara, Bolivia, 3,000 meters (collection of Fassl).

ENTOMOLOGY.—*South African bees of the genera* Scrapter *and* Notomelitta (Hymenoptera).[1] T. D. A. COCKERELL, Boulder, Colo. (Communicated by C. F. W. MUESEBECK.)

The types of the new species described herein will all be placed in the British Museum, from which they were received.

Genus Scrapter Lepeletier and Serville

Scrapter braunsianus Friese and S. leonis Cockerell

Turner's No. 16, represented by 30 females and 5 males from Worcester, C. P., Lion's Head, Cape Town, and (1 female) Rapenburg, Cape Flats, is a mixture of three different things. The Rapenburg species has light red hair at end of abdomen, and mainly red tarsi, so it is quite distinct from the others. Sixteen females from Worcester agree with *S. braunsianus*, while 13 females and 5 males from Lion's Head are conspicuously smaller and must be referred to *S. leonis* Cockerell, although the recurrent nervures are in most specimens nearly equally distant from the ends of the second submarginal cell. It is now questionable whether *S. leonis* is really distinct from *S. capensis* (Friese), but the latter was based on a male, 10 mm long, from Little Namaqualand, and the males of the Turner species are all much smaller. Hence it appears certain that the original *S. capensis* is a different species, though *S. leonis* may later have been confused with it.

Scrapter subincertus, n. sp.

Female.—Length about 8 mm; shining black, the abdomen without bands; head broad, face and front with long white hair, not hiding the surface of the face; mandibles very faintly brownish; flagellum brown beneath except at base; clypeus coarsely punctured, with a deep median groove on upper half; supraclypeal area brilliantly polished; thorax with thin, pale hair, scanty above, except behind scutellum, where it is slightly reddish; mesonotum coarsely punctured, shining between the punctures; scutellum polished; area of metathorax rugulose and dull; tegulae very dark brown; wings dusky hyaline; stigma red, nervures brown; basal nervure falling a moderate distance short of nervulus; second submarginal cell long (much longer than in supposed female of *S. niger* Lepeletier and Serville), receiving first recurrent nervure some distance from base, the second more distant, but not twice as distant, from end (in *S. pallidipennis* Cockerell the first recurrent is nearer the base); legs black, with the tarsi reddish, and the anterior tibiae red in front; scopa of hind legs all pale; hair at end of abdomen pale, slightly reddish.

Cape Province: Rapenburg, Cape Flats, October 1–14, 1920. (R. E. Turner, 16 in part.) I was puzzled to know whether this could be the female of *S. niger*, but what I have identified as probably *S. niger*, from Natal, is certainly different. *S. niger* was described from Caffraria. The darker nervures, the absence of the dusky cloud beyond the cells, the details of the venation, and the dark tegulae rule out *S. pallidipennis* Cockerell. *S. divergens* Brauns I know only in the male; it has the face narrow; the flagellum dusky reddish orange beneath; tarsi dark, hind legs very slender; basal nervure falling short of nervulus; second submarginal cell receiving recurrent nervures about equally distant from base and apex; mandibles strongly bidentate; first tergite elevated, strongly convex in lateral profile, with a deep suture between it and second; mesonotum coarsely punctured; area of metathorax dull. Found by Brauns at Willowmore. Evidently this is related to *S. subincertus*, but I think it can not be its male. *S. glaberrimus* Friese, among other characters, has a very much larger and darker stigma.

Scrapter merescens, n. sp.

Female.—Length 8–9 mm; black, shining, the mesonotum closely punctured and not highly polished; pubescence scanty, not red on thorax above; the abdomen without hair-bands, the hair at apex black. Clypeus closely and finely punctured; mandibles black, supraclypeal area polished; face broader than long; antennae black, rufescent apically beneath; wings dusky, with brown nervures, stigma rather slender, dark brown; second submarginal cell long, receiving recurrent nervures far from base and apex; basal nervure falling short of nervulus; tibial scopa pale, not bicolored.

Considerably smaller than *S. braunsianus*

[1] Received August 28, 1944.

Friese and distinguished from *S. leonis* Cockerell by the duskier wings and the absence of red hair on the scutellum, as well as the broader head. The mesonotum is entirely different from that of *S. glaberrimus* Friese. It is smaller than *S. fuscipennis* Friese, without the bicolored scopa. *S. fuscipennis* is described from "Kapland," without precise locality.

Cape Province: Worcester, September, and August 31, 1928. (R. E. Turner.) Seven females. There is a single male, taken at Worcester by Turner in the latter part of August 1928, which should apparently belong to this species, but the wings are only faintly brownish, and the long hair on the posterior part of the thorax above is light yellow, contrasting with the pure white hair of the mesonotum. The legs are black. This is much larger than *S. glaberrimus* Friese, and the stout abdomen does not have the constriction, between the first and second tergites, so conspicuous in *S. glaberrimus*.

Scrapter macrocephalus Cockerell is very much like *S. merescens* but is easily distinguished by the light hair at end of abdomen and the highly polished scutellum.

Scrapter sinophilus, n. sp.

Male (type).—Length about 9 mm; black, with the tarsi light yellow, dark at end; pubescence long and white, varying to red on thorax above; face densely covered with pure white hair; mandibles black; flagellum long, dusky reddish beneath; face dull; mesonotum dullish, finely punctured, more shining posteriorly; area of metathorax dull; tegulae small, very dark brown; wings hyaline, stigma dusky reddish, nervures pale brown; basal nervure falling far short of nervulus; second submarginal cell very long, receiving recurrent nervures far from base and apex; hind legs long and slender, the spurs very long; abdomen rather slender, moderately shining, the depressed hind margins of tergites colorless; first tergite narrowly reddened apically; middle tergites with thin hair-bands.

Female.—Similar, but stouter, with the legs all black, and the hyaline hind margins of tergites much broader; wings more brownish; flagellum red beneath; hair of scutellum clear ferruginous, of mesonotum whitish, but not clear white.

Cape Province: Mossel Bay, August 1932, 12 males, 4 females (R. E. Turner, 18).

In my key this runs (male) near *S. flavitarsis* Cockerell but is larger, with dark antennae. In Friese's table the male runs nearest to the much smaller *S. glaberrimus* Friese.

The female runs in Friese's table to *S. longulus* Friese, but that is quite different, as shown in Stylops, March 1933. *S. longulus* differs by the extremely broad head and the basal prominence on third abdominal sternite of the male.

Scrapter flavipes Friese

Seven from Umtata, Transkei, February–March 1923; 10 from Weenen, Natal, January 1925. The first taken by R. E. Turner (his 17), the others by H. P. Thomasset. The sexes differ in the marking of the abdomen, so that they might be taken for different species. In the females, the short black vertical mark at each side of the red second tergite is characteristic. The types came from Zululand.

Scrapter flavostictus Cockerell

Natal: Van Reenen, Drakensberg, December 1926 and March 7, 1927, 9 males, 11 females (R. E. Turner, 15).

Scrapter brunneipennis, n. sp.

Male.—Length about 8 mm, anterior wing 6.3 mm; black, shining, the head and thorax with long white hair; mandibles faintly reddish apically; face with very long white hair; antennae long, the flagellum obscurely reddish beneath; mesonotum shining, with large punctures, and a strong median sulcus; scutellum highly polished; area of metathorax entirely dull; tubercles black; tegulae very dark brown; wings rather dilute fuliginous, stigma dusky brown; lower section of basal nervure not arched (as it is in *S. caffra* Brauns); second submarginal cell of the shorter type (style of *S. perpunctatus* Cockerell); first recurrent nervure ending a little nearer base of second submarginal cell than second to apex; legs black, tarsi pale reddish, fron tibiae pale yellowish in front, middle tibiae pale at base and apex; abdomen very stout, black, without hair-bands, the apex with scanty dark hair.

Cape Province: Mossel Bay, August 1932 (R. E. Turner).

Easily known from *S. sinophilus* by the shining mesonotum with very strong punctures, pale reddish tarsi, much shorter second submarginal cell, and abdomen without hair-bands. Known from *S. leonis* Cockerell by the pale reddish stigma and very brown wings. The wings are much brower and the stigma is not so red as in *S. subincertus*. *S. perpunctatus* Cockerell, known only from the female, is very similar, but the stigma is larger and darker, and the area of metathorax quite different, with conspicuous raised ridges. *S. caffra* Brauns, of which I have seen the male, differs in venation and otherwise. There remains the briefly described *S. fuscipennis* Friese, known only in the female, 10 mm long. It is not impossible that our insect is the male of *S. fuscipennis*.

Scrapter sphecodoides Friese

Cape Province: Matjesfontein, October 16–21, 1928 (R. E. Turner). I have specimens from Cape Town collected by Peringuey.

Genus **Notomelitta** Cockerell

Notomelitta rufocincta, n. sp.

Male (type).—Length 12–12.5 mm, rather slender, with shining abdomen as in *N. politissima* Cockerell, which it closely resembles, but it differs by having the second and third abdominal segments, above and below, bright ferruginous, the tergites each with a very broad triangular black mark, based posteriorly; the first tergite is sometimes slightly reddish at sides, and the fourth sternite is largely reddish, while the fourth tergite is red at the extreme (usually covered) base. There is a variable amount of black hair on the thorax above, especially on the anterior part of the scutellum. The second submarginal cell has its outer side vertical, but the inner very oblique. The abdominal hair-bands are narrower than in *N. politissima*.

Female.—Length about 13 mm. Abdomen colored as in male. Hind basitarsi extremely broad, reddish, with mainly black hair, but white hair in front, and long white hairs at base. The front tarsi are not unusually long.

Natal: Van Reenen, Drakensberg, December 1926 (one male, January 1927). Five males, seven females. In my key in Ann. Mag. Nat. Hist., April 1934, this runs to *N. politissima*. In the key based on venation it runs near to *N. politissima*, but the third submarginal cell is less produced at end. In my key to *Melitta* in Ann. Transvaal Mus. **17**: 76. 1935, it runs nearest to *M. longicornis* Friese, which differs by the dullish, unbanded abdomen. All the specimens were collected by R. E. Turner.

ZOOLOGY.—*A new species of hoplonemertean* (Paranemertes biocellatus) *from the Gulf of Mexico.*[1]

WESLEY R. COE, Osborn Zoological Laboratory, Yale University, and Scripps Institution of Oceanography, University of California. (Communicated by WALDO L. SCHMITT.)

Among the nemerteans collected on the intertidal sand flats near Biloxi, Miss., were three specimens of an undescribed species of *Paranemertes* Coe. Only five other species of that genus have been previously reported; four of these were found on the Pacific coast of North America and one on the coast of South Africa. This new species presents such morphological deviations from the others that their description will supplement in some degree the available knowledge of nemertean morphology.

Individuals of this new species, which may be known as **Paranemertes biocellatus** resemble those of *P. californica*, found on the Pacific coast, in size and general appearance but differ in having the proboscis sheath nearly as long as the body, in the character of the proboscis armature, in size and shape of ocelli, and in other morphological details. The species also resembles *Amphiporus bioculatus* McIntosh in having a narrow, pointed head and a single pair of ocelli but differs widely in most other characteristics.

DESCRIPTION

Body long, moderately slender, pointed anteriorly and much flattened in intestinal region. Shape and general appearance similar to the published figure of *P. californica* (Coe, 1904, pl. 15, fig. 2). Size when mature 60 to 120 mm or more in length and 2 to 4 mm in width.

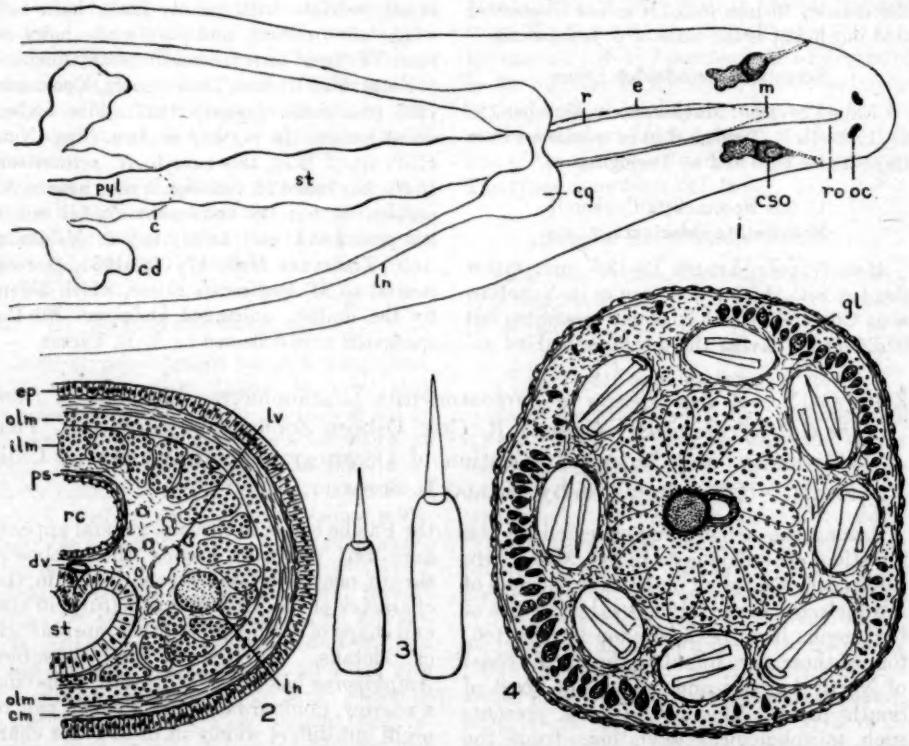
[1] Received October 5, 1944.
Contributions of the Scripps Institution of Oceanography, New Series No. 241.

Color.—Although no record is available as to the details of coloration in life, the specimens a short time after preservation were translucent, with a pale opalescence and tinges of green and rose anterior to the intestinal region. The rest of the body varied from pale to deep green, fading to colorless near the posterior extremity. The green color was confined mainly to the intestinal diverticula. The general appearance in life must have been similar to the colored figure of *P. californica* published by Coe (1904, pl. 15, fig. 2), although the colors were presumably paler than those shown in that figure.

After clearing in oil the tissues become pale yellowish with the exception of the intestinal diverticula, which retain their green pigmentation.

Ocelli.—The tip of the head is provided with a single pair of large, kidney-shaped, intensely black ocelli. These are always conspicuous after clearing in oil, and presumably also in life, although they are situated deep in the tissues of the head. In a specimen about 100 mm in length each ocellus measures 0.009 mm in length and 0.006 mm in diameter (Fig. 1).

Proboscis.—This species differs from the other described species of the genus in having



Paranemertes biocellatus, n. sp.: FIG. 1.—Diagram of organ systems in anterior end of body after clearing in oil; *c*, caecum; *cd*, caecal diverticulum; *cg*, cerebral ganglion; *cso*, cerebral sense organ; *e*, esophagus; *ln*, lateral nerve cord; *m*, opening of mouth into rhynchodeum; *oc*, ocellus; *pyl*, pylorus; *r*, rhynchodeum; *ro*, rhynchodeal opening on ventral surface of head; *st*, stomach. FIG. 2.—Portion of transverse section of body posterior to brain, showing the two layers of longitudinal muscles; *cm*, circular muscular layer; *dv*, dorsal blood vessel; *ep*, epithelium of body wall; *ilm*, inner layer of longitudinal muscles; *ln*, lateral nerve cord; *lv*, lateral blood vessel, with branches in surrounding parenchyma; *olm*, outer layer of longitudinal muscles; *ps*, proboscis sheath; *rc*, rhynchocoel; *st*, stomach. FIG. 3.—Central stylet and basis from two individuals. FIG. 4.—Diagram of transverse section through septum of proboscis, showing, in center, stylet basis and canal leading from anterior to posterior proboscis chamber, and longitudinal musculature surrounded by eight pouches of accessory stylets; *gl*, wreath of pigmented gland cells.

the proboscis sheath nearly as long as the body. The proboscis is armed with a slender, nearly cylindrical basis and with four or eight pouches of accessory stylets (Fig. 4). In one specimen the basis was of nearly equal diameter throughout the entire length and truncated posteriorly, while in another specimen it was slightly enlarged posteriorly (Fig. 3). In an individual exceeding 100 mm in length the basis was four times as long as its diameter, measuring 0.24 mm in length and 0.052 to 0.06 mm in diameter. In an individual 45 mm long the basis was only 0.016 mm long and 0.05 mm wide anteriorly and 0.07 mm posteriorly. The stylets are approximately two-thirds as long as the bases. The latter are deep brown in color. There are 12 proboscidial nerves.

Musculatures.—In this species, as in the others of the genus, the longitudinal musculature in the anterior portion of the body is divided into two distinct layers, as described and figured by Coe (1904, 1905) for *P. californica*. Of these, the outer layer is approximately equal to the circular layer in thickness, while the inner layer averages several times as thick. The two layers are separated by a thin sheet of connective tissue carrying numerous blood vessels and branches of the lateral peripheral nerves (Fig. 2). In the brain region this inner musculature closely invests the brain and esophagus and so nearly fills all the space between these organs and the outer muscular walls that the cephalic parenchyma is reduced to small patches. This inner longitudinal musculature is continuous with the proboscis insertion musculature.

In the region of the pylorus the sheet of connective tissue separating the two longitudinal musculatures becomes thicker but diminishes again anterior to the intestinal region, and the two layers become united more posteriorly. The inner portion can, however, be recognized by its larger fibers far back in the intestinal region.

Digestive system.—As shown in Fig. 1, the mouth opens by a long slit into the rhynchodeum some distance posterior to the rhynchodeal opening when the proboscis remains in its normal position within the body. The slender esophagus leads to the elongated stomach and thence to the slender pylorus, which opens into the midgut somewhat farther behind the brain than the distance from brain to tip of head. The caecum is remarkably short and bears but a single pair of diverticula (Fig. 1). The paired midgut diverticula are as in other species.

Blood and nephridial systems.—In the two specimens cut into serial sections the blood vessels were much contracted, both in the head and throughout the body. Near its origin from the cephalic anastomosis of the lateral vessels, the dorsal vessel passes into, but not through, the wall of the proboscis sheath for a short distance and then continues on the ventral side of the sheath to the posterior end of the body. There are numerous connections between the dorsal and lateral vessels.

In neither of the two specimens are the nephridial canals well preserved, nor could the efferent ducts be demonstrated. The same difficulty was encountered in two specimens of *P. californica* (Coe, 1905), although in a third specimen both the canals and the efferent ducts were conspicuous (Coe, 1940).

Nervous system.—The brain is situated farther back from the anterior end of the head than in most hoplonemerteans (Fig. 1). The four ganglia and their dorsal and ventral commissures are of the usual hoplonemertean type. The 12 proboscidial nerves are large and well differentiated from the interneural plexus. The lateral nerves unite posteriorly on the dorsal side of the rectum.

Cerebral sense organs.—These organs, with their sensory and glandular components, are relatively small, elongated structures situated far anterior to the brain. They are connected with the exterior by a pair of ciliated canals leading anterolaterally to the lateral surfaces of the head (Fig. 1).

Reproductive organs.—The gonads are of the usual hoplonemertean type, alternating more or less regularly with the intestinal diverticula. The gametes were not fully ripe in December.

Habitat.—These specimens were found burrowing in intertidal sand flats at Deer Island and at two other localities on the shore at Biloxi, Miss., by M. W. Williams. Cotypes, U.S.N.M. 20641.

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ICHTHYOLOGY.—*A new species of cichlid fish of the genus* Petenia *from Colombia.*[1]

LEONARD P. SCHULTZ, U. S. National Museum.

Recently, while studying the cichlid fishes of Venezuela and attempting to identify other specimens from South America in the collections of the U. S. National Museum that had never been identified or reported upon, I came across two fishes that appear to belong to a new species of the genus *Petenia*. A few years ago Dr. George S. Myers, when in charge of the fish collections in the National Museum, had examined these two specimens and noted that they seemed to represent a new species, but he did not work up a description or separate it from other members of the genus. In view of Dr. Myers's preliminary notation, I take great pleasure in naming this new species in his honor.

Genus **Petenia** Günther

Petenia Günther, Catalogue of the fishes in the British Museum **4**: 301. 1862. (Genotype: *Petenia splendida* Günther.)

Petenia myersi, n. sp.

Holotype.—U.S.N.M. no. 120533, a specimen 137 mm in standard length, collected by Brother Nicéforo María, in the Río Dedo, tributary of the Río Orteguaza, near Florencia (Amazon system), Colombia.

Paratype.—U.S.N.M. no. 120534, a specimen 65 mm in standard length with same data. This fish is in poor condition, with injured snout, and was preserved in a hunchback position. Measurements, therefore, may not be very reliable, although I tried to straighten the specimen.

Description.—Measurements are expressed in hundredths of the standard length, first for the holotype, then for the paratype in parentheses. Standard length in mm 137 (65).

Length of head 37.9 (40.0); greatest depth of body 43.1 (46.9); length of snout 14.6 (13.1); diameter of eye 8.61 (11.5); width of interorbital space 10.2 (9.23); least width of preorbital 4.89 (4.62); postorbital length of head 15.7 (16.9); snout tip to rear end of maxillary 24.1 (– –); snout to nostril 10.9 – –); eye to nostril 3.65 (3.08); length of caudal peduncle 17.7 (14.2); least depth of caudal peduncle 14.2 (13.8); length of fifth dorsal spine 12.4 (16.5); length of last dorsal spine 12.4 (– –); longest ray of pelvics 31.0 (31.5); longest ray of pectorals 21.5 (24.9); distance out from base that caudal fin is scaled 13.9 (11.5); longest caudal fin ray 25.5 (26.2).

The following counts were made, respectively: Dorsal rays XV,13 (XV,13); anal rays V,9 (V,9); pectoral rays 15-15 (15-15); pelvic rays, I,5-I,5 (I,5-I,5); branched caudal fin rays 14 (14); scale rows below lateral line 32 (32); scales from dorsal origin to lateral line 6 (6); scales from pelvic base to lateral line 12 (12); pores in lateral line 18+13 (18+11); scales from base of last dorsal spine to lateral line and on base of dorsal 5+2 (5+2); zigzag row of scales around caudal peduncle 20 (20).

Body compressed, greatest depth at origin of dorsal fin 2½ in standard length; caudal peduncle a little longer than deep; head 2¾ in standard length; eye 1.9 in snout and 4½ times in head; interorbital equal to snout tip to nostril and 3¾ in head; snout tip to rear of maxillary 1.6 in head, maxillary curving downward to under middle of eye; premaxillary greatly protractile, the premaxillary process reaching to a vertical through middle of operculum; gill rakers short, stubby, about 1+9; teeth in a villiform band on both jaws, the outer rows enlarged, curved, conical, caninelike teeth and widely spaced, largest forward; upper and lower lips fleshy, continuous around the end of the jaw without a frenum; scales large, ctenoid, forward on top of head to middle of interorbital space; cheeks and operculum scaled, except the preopercular edge posteriorly, which is naked; spinous dorsal with a row of scales at its base posteriorly, then several rows of scales on soft dorsal, mostly on membranes between the rays; base of anal fin similarly scaled; caudal fin scaled out for half its length; soft rays of vertical fins prolonged; soft rays of pelvic fins filamentous and extending to opposite base of first few anal spines; pectoral fin rounded, reaching just past the middle black vertical bar; nostril twice nearer eye than tip of snout.

Color (in alcohol).—Light brownish, darker above, paler ventrally; a black vertical bar beginning at dorsal origin, passing through eye, thence downward just behind maxillary to un-

[1] Published by permission of the Secretary of the Smithsonian Institution. Received April 13, 1944.

TABLE 1.—FIN-RAY COUNTS RECORDED FOR THE SPECIES OF PETENIA

Species	Dorsal							Anal					
	Spines			soft				Spines			soft		
	XV	XVI	XVII	10	11	12	13	V	VI	VII	8	9	10
splendida....	x[1]	x	—	—	—	x	x	x	x	—	x	x	x
spectabilis...	x	—	—	—	—	x	x	—	x	—	—	x	x
kraussii.....	4	15	1	4	16	—	—	—	19	1	5	14	1
myersi.....	2	—	—	—	—	—	2	2	—	—	—	2	—

[1] x means that counts were taken from the literature.

derside of head; brownish area on back below front of spinous dorsal fading at lateral line; then a second vertical dark brownish bar from bases of seventh to tenth dorsal spines downward across middle of body to a little in front of anus; third vertical bar extending downward from front of soft dorsal and fourth at and a little behind rear of soft dorsal; fifth bar occurring at rear of caudal peduncle, narrowly separated from a dark bar at base of caudal fin; a more or less indistinct and broken lateral band from behind eye to caudal peduncle on the holotype but lacking on the paratype; pelvics blackish; other fins appearing to be plain in color at the present time.

Remarks.—The members of the genus *Petenia* may be recognized by the combination of the following characters: Premaxillary extremely protractile, with the ascending process reaching from behind the orbits to a vertical line through middle of operculum, this premaxillary process nearly as long as length of head; lips thick, fleshy, without a frenum; maxillary much exposed, only partly slipping under preorbital, and extending to a vertical line through middle of eye; in the outer row teeth enlarged, curved, conical, and widely spaced, followed by a band of villiform teeth inside; lateral line interrupted, continuing on middle of caudal peduncle; the upper lateral line separated from base of dorsal fin by 4 or more full-sized scales; lateral line scales same size as those above and below; gill rakers short, thick, about 9 or 10 on lower part of first arch; preorbital narrower than diameter of eye; nostril closer to eye than tip of snout; bases of soft

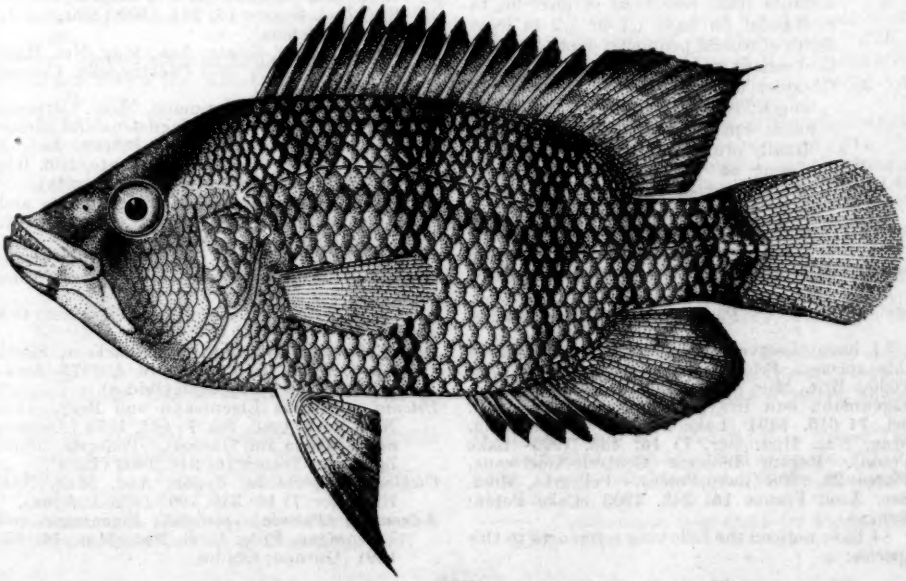

FIG. 1.—*Petenia myersi*, n. sp.: Holotype (U.S.N.M. No. 120533). Drawn by Mrs. Aime N. Awl.

rays of median fins scaled; gill membranes joined but forming a wide, free fold across isthmus; scales ctenoid; dorsal rays XV or XVI, rarely XVII, 10 to 13; anal V or VI (rarely VII), 8 to 10. See Table 1 for counts made on the species of *Petenia*.

This new species may be distinguished from all others referred to the genus *Petenia* by the following key:

1*a*. Pores in lateral line 18 to 21+15 to 20; 6 to 8 black blotches along midaxis, first on opercle, then 5 or 6 on midaxis of body, the last an ocellated spot on base of upper rays of caudal fin; head and median fins black spotted; scale formula—6 from dorsal origin to lateral line, 38 to 41 from upper opercular opening to midcaudal fin base below lateral line, and 15 to 20 from pelvic origin to lateral line; dorsal rays XV or XVI, 12 or 13; anal V or VI, 8 to 10; head 2¼ to 3, depth 2¼ to 2⅔ in standard length ..... *Petenia splendida* Günther[2]

1*b*. Pores in lateral line 18 to 20+9 to 13; scale formula—5 or 6+29 to 32+11 to 13; color pattern of blackish vertical bars or not more than 3 black blotches along midaxis; head 2¼ to 2⅔ in standard length.

2*a*. Three black blotches along midaxis, the first on opercle, sometimes joining with a black blotch on shoulder at beginning of lateral line, the second in middle of length below lateral line, the third an ocellated spot on base of upper caudal fin rays; no black vertical bar through eye; distance from rear base of anal fin to midcaudal fin base 1.1 or 1.2 in least depth of caudal peduncle; depth 2¼ to 2⅔ in standard length.

3*a*. Greatest depth 2¼ to 2⅔ in standard length; last dorsal spine 2⅔ to 2⅔ in head; opercular and shoulder spots usually prominent on adults, less so or absent on young; about 6 usually double darkish vertical bars on body and vertical fins somewhat black spotted; dorsal rays XV or XVI, 10 or 11; anal VI, rarely VII, 8 or 9; scales 6+29 to 30+11 to 13; pores in lateral line 19 or 20+9 to 11 ..... *Petenia kraussii* Steindachner[3]

3*b*. Greatest depth 2 in standard length; last dorsal spine $2\frac{3}{16}$ in head; shoulder spot and opercular spot absent; vertical fins not spotted; vertical dark bars lacking; dorsal rays XV, 12 or 13; anal rays VI, 9 or 10; scales 5 or 6+30+11 or 12; pores in lateral line 19 or 20+11 to 13 ..... *Petenia spectabilis* (Steindachner)[4]

2*b*. No ocellate black spot on caudal fin base; a blackish bar from dorsal origin through eye to underside of head; a second blackish bar from middle of base of spinous dorsal to belly in front of anus, a third one from front of soft dorsal, one or two more bars on caudal peduncle, and another blackish bar on base of caudal fin; pelvics black; vertical fins probably black spotted; no black blotches along midaxis of body, as in 2*a*; a more or less indistinct darkish lateral streak along midaxis on adult, absent on small specimen; length of caudal peduncle about 0.8 or 0.9 in its least depth or longer than deep: least depth 2¼ to 2⅔ in standard length; dorsal rays XV, 13; anal rays V, 9; scales 6+32+12; lateral line pores 18 or 19+11 to 13 ..... *Petenia myersi*, n. sp.

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[2] I have observed the following references to this species: *Petenia splendida* Günther, Cat. Fishes Brit. Mus. **4**: 301. 1862 (Lake Petén).—Eigenmann and Bray, Ann. New York Acad. Sci. **7**: 615. 1894 (Lake Petén).—Regan, Ann. Mag. Nat. Hist. (ser. 7) **16**: 433. 1905 (Lake Petén).—Regan, Biologia Centrali-Americana, Pisces: 29. 1908 (Lake Petén).—Pellegrin, Mem. Soc. Zool. France **16**: 243. 1903 (Lake Petén; Bélize).

[3] I have noticed the following references to this species: *Petenia kraussii* Steindachner, Denkschr. Akad. Wiss. Wien **39**: 28, pl. 2, fig. 1, a–b. 1878 (Río Magdalena); **42**: 56. 1879 (Río Cauca); **72**: 130. 1902 (Río Lebrija, trib. Río Magdalena at Santander).—Eigenmann and Bray, Ann. New York Acad. Sci. **7**: 615, 1894 (Río Magdalena).—Pellegrin, Mem. Soc. Zool. France **16**: 244, 1903 (Maracaibo; Río Magdalena).

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